SINGAPORE-MIT ALLIANCE
SMA-2 PUBLICATIONS

AMM&NS programme (AY 2008/2009)

Number of Research Projects with publications: 1 FRP and 5 IUPs

(A) Collaborative Publications with SMA-MIT Fellows

(1) FRP: Advanced Materials and Nanotechnology on a Silicon Platform

AY 2008/2009

Journal Publication

1. J P Zou, Q Zhang, N Marzari & H Li, "Theoretical study of the performance for short channel carbon nanotube transistors with asymmetric contacts", Physics Letters A, Vol. 372, pp. 6940, 2008.

2. N Peng, Q Zhang, C L Chow, O K Tan & N Marzari, "Sensing Mechanisms for Carbon Nanotube Based NH_3 Gas Detection", Nano Letters, Vol. 9, pp. 1626, 2009.

3. N Peng, Q Zhang, O K Tan & N Marzari, "Study of gaseous interactions in carbon nanotube field-effect transistors through selective Si_3N_4 passivation", Nanotechnology, Vol. 19, pp. 465201, 2008.

4. N Peng, Q Zhang, O K Tan & N Marzari, "Gate modulation in carbon nanotube field effect transistors-based NH_3 gas sensors", Sensors and Actuators B, Vol. 132, pp. 191, 2008.

5. Q F Yan, L Gao, V Sharma, Yet-Ming Chiang & CC Wong, "Particle and Substrate Charge Effects on Colloidal Self-Assembly in a Sessile Drop", Langmuir, Vol. 24, pp. 11518, 2008.

6. Q F Yan, P Nukala, C C Wong & Yet-Ming Chiang, "Three-Dimensional Metallic Photonic Crystals Fabricated by Double Templating", Thin Solid Films, Accepted, 2009.

7. Q F Yan, X F Ang, C C Wong & Yet-Ming Chiang, "Ordered Macroporous Gold Thin Film with Encaptured Polymer Spheres", Applied Physics A, Vol. 94, pp. 271, 2009.

8. V Sharma, Q F Yan C C Wong, W C Carter, Yet-Ming Chiang, "Controlled and rapid ordering of oppositely charged colloidal particle", Journal of Colloid and Interface Science, Vol. 333, pp. 230, 2009.

Conference Publication

1. Chan Hoe Yip, Yet-Ming Chiang & C C Wong, "The Effect of Inverse Opal Film Thickness on the Efficiency of a Photonic Crystal Dye-Sensitized Solar Cell", Thinfilms08 Conference, Singapore, July 2008.

2. Chan Hoe Yip, Yet-Ming Chiang & C C Wong, "Large Area TiO_2 Inverse Opal through Colloidal Self Assembly and Sol Gel Infiltration", International Society of NanoManufacturing Conference, Singapore, September 2008.

3. K H Lee, Q F Yan, H K Kang, C C Wong & F Romanato, "Colloidal Crystal Nanoimprint Method for the fabrication of 2D Plasmonic Crystals", International Society of NanoManufacturing Conference, Singapore, September 2008.

4. M Wang, G Han, C V Thompson, L K Tan & S J Chua, "Growth and Characteristics of ZnO Nanotube Aarrays on Si Substrates by Atomic Layer, Deposition in Anodic Aluminum Oxide", MRS Fall Meeting, Boston, US, November 2008.

5. Q F Yan, C C Wong & Yet-Ming Chiang, "Template Growth of Large-Area Nanostructured Arrays by Using Highly Ordered Anodic Aluminum Oxide Membrane", International Society of NanoManufacturing Conference, Singapore, September 2008.

(2) IUP: Lattice-Mismatched Materials

Journal Publication

1. H Tanoto, S F Yoon, C Y Ngo, C Dohrman, E A Fitzgerald, L H Tan & C H Tung, "Origin and suppression of V-shaped defects in the capping of self-assembled InAs quantum dots on graded SiGe/Si substrate", Applied Physics Letters, Submitted.

2. H Tanoto, S F Yoon, C Y Ngo, W K Loke, C Dohrman, E A Fitzerald & B Narayanan, "Structural and optical properties of stacked self-assembled InAs/InGaAs quantum dots on graded SiGe/Si substrate", Applied Physics Letters, Vol. 92, pp. 213115-1 to 213115-3, 2008.

3. H Tanoto, S F Yoon, K L Lew, W K Loke, c Dohrman, E A Fitzgerald & L J Tang, "Electroluminescence and structural characteristics of InAs/InGaAs quantum dots grown on graded SiGe/Si substrate", Applied Physics Letters, Submitted.

4. H Tanoto, S F Yoon, W K Loke, K P Chen, C Dohrman, E A Fitzgerald & B Narayanan, "Heteroepitaxial growth of GaAs on (100) Ge/Si using migration enhanced epitaxy", Journal of Applied Physics, Vol. 103, pp. 104901-1 to 104901-6, 2008.

5. J F Falth, S F Yoon & E A Fitzgerald, "The influence of substrate temperature on InAsN quantum dots grown by molecular beam epitaxy", Nanotechnology, Vol. 19, pp. 455606-1 to 455606-6, 2008.

6. K L Lew, S F Yoon, K P Chen, H Tanoto, Y Yu, C L Dohrman & E A Fitzgerald, "High frequency AlGaAs/GaAs heterojunction bipolar transistor on graded SiGe/Si substrate", Journal of Applied Physics, Submitted.

7. K P Chen, S F Yoon, T K Ng, H Tanoto, K L Lew, C L Dohrman & E A Fitzgerald, "Characterization of GaAs grown on SiGe/Si graded substrates using P-N junction diodes", Journal of Applied Physics, Vol. 104, pp. 073710-1 to 073710-6, 2008.

8. K P Chen, S F Yoon, T K Ng, H Tanoto, K L Lew, C L Dohrman & E A Fitzgerald, "Study of surface microstructure origin and evolution for GaAs grown on Ge/SiGe/Si substrate", Journal of Physics D: Applied Physics, Vol. 42, pp. 035303-1 to 035303-4, 2009.

9. T K Ng, S F Yoon, K H Tan, K P Chen, H Tanoto, K L Lew, S Wicaksono, W K Loke, C Dohrman & E A Fitzgerald, "Molecular beam epitaxy growth of bulk GaNAsSb on Ge/graded-SiGe/Si substrate", Journal of Crystal Growth, Accepted 2008.

Conference Publication

T K Ng, S F Yoon, K H Tan, K P Chen, H Tanoto, K L Lew, S Wicaksono, W K Loke, C Dohrman & E A Fitzgerald, "Molecular beam epitaxy growth of bulk GaNAsSb on Ge/graded-SiGe/Si substrate", 2008 MBE Conference, Vancouver, Canada.

(3) IUP: Synthesis and Stress Study of Nanocrystals formed in a Confined Space

Journal Publication

W K Choi, T H Liew, M K Dawood, Hi Smith, C V Thompson & MH Hong, "Synthesis of silicon nanowires and nanofin arrays using interference lithography and catalytic etching", Nano Letters, Vol. 8, pp. 3799, 2008.

(4) IUP: Enabling Materials Technology for 3D IC's and Heterogeneous Systems

Journal Publication

SINGAPORE-MIT ALLIANCE
SMA-2 PUBLICATIONS

1. F L Wei, C L Gan, T L Tan, C S Hau-Riege, A P Marathe, J J Vlassak & C V Thompson, "Electromigration-Induced Extrusion Failures in Cu/low-k Interconnects", Journal of Applied Physics, Vol. 104, Issue 2, pp. Art. No. 023529, 2008.

2. H L Leong, C L Gan, C V Thompson, K L Pey & H Y Li, "Electromigration-induced bond improvement for three-dimensional integrated circuits", Applied Physics Letter, Vol. 94, Issue 8, pp. Art. No. 081901, 2009.

3. H L Leong, C L Gan, R I Made, C V Thompson, K L Pey & H Y Li, "Electrical characterization and modelling of the contact resistance of Cu-Cu bonded interconnects", Journal of Applied Physics, Vol. 105, Issue 3, pp. Art. No. 033514, 2009.

4. R I Made, C L Gan, L L Yan, A B Yu, S W Yoon, J H Lau & C Lee, "Study of low-temperature thermocompression bonding in Ag-In solder for packaging applications", Journal of Electronics Materials, Vol. 38, Issue 2, pp. 365 – 371, 2009.

5. X D Wang, K L Pey, W K Choi, C K F Ho, E Fitzgerald & D Antoniadis, "Arrayed Si/SiGe nanowire heterostructure formation via Au-catalyzed wet chemical etching method", Electrochemical and Solid-State Letters, Vol. 12, Issue 5, pp. K37 – K40, 2009.

Conference Publication

X D Wang, K L Pey, W K Choi, C K F Ho, E Fitzgerald & D Antoniadis, "Arrayed Si/SiGe nanowire heterostructure formation via Au-catalyzed wet chemical etching method", ECS 214th meeting, Hawaii, USA, 12 – 17 October 2008.

SINGAPORE-MIT ALLIANCE
SMA-2 PUBLICATIONS

AMM&NS programme (AY 2008/2009)

(B) Non-collaborative Publications

(1) FRP: Advanced Materials and Nanotechnology on a Silicon Platform

AY 2008/2009

Journal Publication

1. C A Ross, J Y Cheng, "Patterned Magnetic Media made by Self- Assembled Block Copolymer Lithography", MRS Bulletin, Accepted September 2008.

2. C A Ross, Y S Jung, V P Chuang, F Ilievski, J K W Yang, I Bita, E L Thomas, H I Smith, K K Berggren, G J Vancso & J Y Cheng, "Si-containing block copolymers for selfassembled nanolithography", Journal of Vacuum Science and Technology B, Vol. 26, pp. 2489 (Invited Paper), 2008.

3. E Verploegen, T Zhang, Y S Jung, C A Ross &P T Hammond, "Controlling the Morphology of Side Chain Liquid Crystalline Block Copolymer Thin Films through Variations in Liquid Crystalline Content", Nano Letters, Vol. 8, pp. 3434, 2008.

4. Ion Bita, Joel K W Yang, Yeon Sik Jung, K Berggren, C A Ross & E L Thomas, "Graphoepitaxy of selfassembled block copolymers on 2D periodic patterned templates", Science, Vol. 321, pp. 939, 2008.

5. K W Tan, G Li, Y K Koh, Q F Yan & C C Wong, "Layer-by-Layer Growth of Attractive Binary Colloidal Particles", Langmuir, Vol. 24, pp. 9273, 2008.

6. L A Herman, Chan Hoe Yip & C C Wong, "Opaline Backreflector Coating in Dye Sensitized Solar Cell Application", Journal of Nanoscience and Nanotechnology, Accepted 2009.

7. L K The, Q F Yan & C C Wong, "Fabrication of suspended nanoparticle layer on porous close-packed colloidal arrays", ACS Applied Materials and Interfaces, Accepted 2009.

8. O M Nayfeh, D.A. Antoniadis, K. Mantey & M.H. Nayfeh, "Uniform Delivery of Silicon Nanoparticles on Device Quality Substrates using Spin-Coating from Isopropyl Alcohol Colloids", Applied Physics Letters, Accepted 2009.

9. O M Nayfeh, D.A. Antoniadis, K. Mantey & M.H. Nayfeh, "Memory effects in metal-oxide semiconductor capacitors incorporating dispensed highly monodisperse 1 nm Si nanoparticles", Applied Physics Letters, Vol. 90, pp. 153015, 2007.

10. S T Boles, C V Thompson & E A Fitzgerald, "Influence of indium and phosphine on Aucatalyzed InP nanowire growth on Si substrates", Journal of Crystal Growth, Vol. 311, pp. 1446, 2009.

11. V P Chuang, C A Ross, P Bilalis & N Hadjichristides, "Arrays of Nano-scaled Rings From Self-Assembled Triblock Terpolymer Templates", ACS Nano, Vol. 2, pp. 2007, 2008.

12. V P Chuang, W Jung, C A Ross, J Y Cheng, Oun-Ho Park & Ho-Cheol Kim, "Multilayer magnetic antidot arrays from block copolymer templates", Journal of Applied Physics, Vol. 103, pp. 074307, 2008.

13. Y J Oh, C A Ross, Y S Jung, Y Wang & C V Thompson, "Co nanoparticle arrays made by templated solidstate dewetting", Small, In press 2009.

14. Y S Jung & C A Ross, "Solvent vapor induced tunability of self-assembled block copolymer patterns", Advanced Materials, In press 2009.

15. Y S Jung & C A Ross, "Well-ordered thin film nanopore arrays formed using a block copolymer template", Small, In press 2009.

16. Y S Jung, W Jung & C A Ross, "Self-assembled ring structures from a diblock copolymer under circular confinement", Nano Letters, Vol. 8, pp. 2975, 2008.

17. Y S Jung, W Jung H L Tuller & C A Ross, "Nanowire conductive polymer gas sensor patterned using selfassembled block copolymer lithography", Nano Letters, Vol. 8, pp. 3776, 2008.

18. Yeon Sik Jung, C A Ross, "Orientation-controlled Self-assembled Nanolithography using a Polystyrene-Polydimethylsiloxane Block Copolymer", Nano Letters, Vol. 7, pp. 2046, 2007.

Conference Publication

1. C Xu, Chan Hoe Yip & C C Wong, "TiO2 Mesoporous Thin Films for Dye-sensitized Solar Cell Applications", Thinfilms08 Conference, Singapore, July 2008.

2. K H Lee, Q L Chen, Chan Hoe Yip, Q F Yan, L K Teh, F Romanato & C C Wong, "Fabrication of Periodic Square Arrays by Angle-Resolved Nanosphere Lithography", Thinfilms08 Conference, Singapore, July 2008.

3. L A Herman, Chan Hoe Yip & C C Wong, "Opaline Backreflector Coating in Dye-sensitized Solar Cell, "Thinfilms08 Conference, Singapore, July 2008.

4. L K Teh, K K Tan, Q F Yan & CC Wong, "Incorporation of Quantum Dots as Planar Defects in Opaline Photonic Crystals", International Society of NanoManufacturing Conference, Singapore, September 2008.

5. L K Teh, Q F Yan & C C Wong, "Wetting Characteristics of Porous Surfaces for Inserting Nanocrystalline Planar Defects within Colloidal Crystals", Thinfilms08 Conference, Singapore, July 2008.

6. N Bonini & N Marzari   Anharmonicity from firstprinciples: transport properties of carbon nanostructures   US-Japan Energy Symposium   Presented July 2008   Cambridge, MA, July 2008   SMA-2

7. N Bonini & N Marzari, "Phonon lifetimes in carbon nanotubes", APS March Meeting, Pittsburgh, US, March 2009.

8. N Marzari, "Engineering nanomaterials from first principles", MRS Spring Meeting, San Francisco, US, April 2009.

9. N Marzari, "Four lectures: I From Bloch to Wannier, II One Bloch at a time, III Engineering carbon nanotubes from first principles, IV Densityfunctional practice", African Institute of Mathematical Sciences, Cape Town, South Africa, July 2008.

10. V P Chuang, C A Ross, J Gwyther & I Manners, "Self-Assembled Surface Patterns From Organometallic Triblock polymer", American Physical Society, Pittsburgh March 2009.

11. V P Chuang, C A Ross, J Gwyther & I Manners, "Self-assembled Nanostructures with Ring Arrays and Square Pattern from Organometallic TRiblock Terpolymer", EIPBN,   Florida, May 2009.

12. V P Chuang, C A Ross, P Bilalis & N Hadjichristidis, "Fabrication of Novel Nanostructures Based on Block Copolymer Lithography", Techcon, Texas September 2008.

13. Y S Jung & C A Ross, "Systematic tunability of self-assembled block copolymer patterns", American Physical Society, Pittsburgh, March 2009.

14. Y S Jung & C A Ross, "Nanofabrication of largescale arrays of ferromagnetic rings, wires, dots, and antidots using self-assembled block copolymer templates", Techcon, Texas, September 2008.

15. Y S Jung, C A Ross, K K Berggren & Y Yang, "Controlled self-assembly of linear structures for nanoscale device fabrication", EIPBN, Florida, May 2009.

Book Chapters

J Y Cheng & C A Ross, "Block copolymer lithography for magnetic device fabrication", Book chapter for "Block copolymer thin films", ed. T.2008 Russell and O. Tsai, 2008.

(2) IUP: Lattice-Mismatched Materials

Conference Publication

S F Yoon, et al, "Recent progress in dilute nitride-antimonide materials for high speed photonics and electronics", 50th State-of-the-art Symposium on Compound Semiconductors, 215th Electrochemical Society Meeting, San Francisco, USA, 24 – 29 May 2009.

(3) IUP: Intergrated MRAM

Journal Publication

1. A O Adeyeye & N Singh, "Large area Patterned Magnetic Nanostructures", Journal of Physics D, Vol. 41, pp. 153001-1 to 153001-29, 2008.

2. C A Ross, F J Castano, W Jung, B G Ng, I A Colin & D Morecroft, "Magnetism in multilayer thin film rings", Journal of Physics D, Vol. 41, pp. 113002-1 to 113002-6, 2008.

3. C C Wang, J Wang, A O Adeyeye & N Singh, "Field-dependent evolution of the magnetic states in Co ring arrays", Journal of Magnetism and Magnetic Materials, Vol. 320, pp. 1781, 2008.

4. C H Nam, B G Ng, F J Castarno & C A Ross, "Effect of magnetic field direction on the remanent resistance levels and vortex chirality of a multilayered magnetic ring", Journal of Applied Physics, Vol. 105, pp. 033918, 2009.

5. C H Nam, B G Ng, F J Castarno, M D Mascaro & C A Ross, "Current-driven vortex formation in a magnetic multilayer ring", Applied Physics Letters, Vol. 94, pp. 082501, 2009.

6. D Jain & A O Adeyeye, "Field orientation dependent vortex formation in multilayer triangular rings", Applied Physics Letters, Vol. 94, pp. 062510, 2009.

7. F J Castano, B G Ng, I A Colin, D Morecroft, W Jung & C A Ross, "Magnetoresistance of submicron multilayer Wheatstone bridges as a probe of magnetic reversal mechanism", Journal of Physics D, Vol. 41, pp. 132005, 2008.

8. S Jain & A O Adeyeye, "Giant Magnetoresistance Behavior of Pseudo Spin Valve Rings with magnetostatically coupled elements", Europhysics Letters, Vol. 84 pp. 17002, 2008.

9. S Jain & A O Adeyeye, "Probing the magnetic states in Mesoscopic rings by synchronous transport measurements in ring-wire hybrid configuration", Applied Physics Letters, Vol. 92, pp. 202506, 2008.

10. S Jain and A O Adeyeye, "Low field giant magnetoresistance in coupled elliptical rings", Journal of Applied Physics, Vol. 104, pp. 103914, 2008.

11. Y Ren & A O Adeyeye, "Magnetic spin states and vortex stability control in elongated Ni80Fe20 nanorings", Journal of Applied Physics, Vol. 105, pp. 063901, 2009.

Conference Publication

J Llandro, T J Hayward, J A C Bland, D Morecroft, F J Castano, I A Colin & C A Ross, "Moment Selective Digital Detection of Single Magnetic Beads for Multiplexed Bioassays", Proceeding European Science Foundation, AIP Conference Proceedings series 1025, pp. 176-185, 2008.

(4) IUP: Nanomechanics Ultra-Fine-Scale Structures and Living Cells

Journal Publication

1. A Li, T S Lim, H Shi, J Yin, K S W Tan & C T Lim, "Single molecular force spectroscopy study of Plasmodium Falciparum-infected erythrocyte cytoadherence to endothelial receptors", American Journal of Tropical Medicine and Hygiene, Vol. 79, Issue 6, pp. 348s, 2008.

2. H Shi, A Li, J Yin, K S W Tan & C T Lim, "AFM study of the extracellular and the cytoplasmic surfaces of Plasmodium Falciparum infected erythrocyte membranes", American Journal of Tropical Medicine and Hygiene, Vol. 79, Issue 6, pp. 355s – 356s, 2008.

3. H W Hou, Q S Li, G Y H Lee, A P Kumar, C N Ong & C T Lim, "Deformability study of breast cancer cells using microfluidics", Biomedical Microdevices, In Press, 2009.

4. M Marinkovic, M Diez-Silva, I Pantic, J J Fredberg, S Suresh & J P Butler, "Febrile temperature leads to significant stiffening of Plasmodium falciparum parasitized erythrocytes", AM J Physiol Cell Physiol, Vol. 296, pp. C59 – C64, 2009.

5. Q S Li, G Y H Lee, C N Ong & C T Lim, "AFM indentation study of breast cancer cells", Biochemical and Biophysical Research Communications, Vol. 374, Issue 4, pp. 609-1 to 609-13, 2008.

6. S J Tan, L Yobas, G Y H Lee, C N Ong & C T Lim, "Microdevice for the isolation and enumeration of cancer cells from blood", Biomedical Microdevices, Submitted, 2009.

7. S R K Vedula, E Mendoz, Sun Wei, T S Lim, A Li, Q S Li & C T Lim, "Human cell as a structure and machine – An engineering perspective", IES Journal Part A: Civil and Structural Engineering, In Press, 2009.

8. Y K Park, M Diez-Silva, G Popescu, G Lykotrafitis, W Choi, M S Feld & S Suresh, "Refractive index maps and membrane dynamics of human red blood cells parasitized by Plasmodium falciparum" PNAS, Vol. 105, Issue 37, pp. 13730 – 13735, 2008.

(5) IUP: Synthesis & Stress Study of Nanocrystals Formed in a Confined Space

Journal Publication

F Zheng, W K Choi & T H Liew, "Influence of substrate geometry on the distribution and stress on Ge nanocrystals in silicon oxide matrix", Journal of Applied Physics, Vol. 104, pp. 084312, 2008.

(6) IUP: Enabling Materials Technology for 3D IC's and Heterogeneous Systems

Journal Publication

1. R Tadepalli, K T Turner & C V Thompson, "Mixed-mode interface toughness of wafer-level Cu-Cu bonds using asymmetric chevron test", Journal of the Mechanics and Physics of Solids, Vol. 56, Issue 3, pp. 707 – 718, 2008.

2. R Tadepalli, K T Turner & C V Thompson, "Effects of patterning on the interface toughness of wafer-level Cu-Cu bonds", Acta Materialia, Vol. 56, Issue 3, pp. 438 – 447, 2008.

Conference Publication

SINGAPORE-MIT ALLIANCE
SMA-2 PUBLICATIONS

1. R I Made, C L Gan & L L Yan, "Effect of Temperature and Bonding Duration on the Mechanical Strengths of Metal-Metal Thermocompression Bonds", Materials and Technologies for 3 D Integration (Mater. Res. Soc. Symp. Proc. Volume 1112, Warrendale, PA, 2008), Boston, USA, November 2008, (pp. E2.4).

2. R I Made, C L Gan, C K Lee, L L Yan, A B Yu & S W Yoon, "Effect of Bonding Pressure on the Bond Strengths of Low Temperature Ag-In Bonds", Proceedings of the 15th International Symposium on the Physical and Failure Analysis of Integrated Circuits, Singapore, July 2008, (pp. 119 – 123).

3. R I Made, C L Gan, C K Lee, L L Yan, A B Yu, S U Yoon & J H Lau, "Characterization of Low-Temperature Wafer Bonding Based on Ag-In System", Proceedings of SPIE (Conference on Reliability, Packaging, Testing, and Characterization of MEMS/MOEMS VII, Vol. 6884, 2008), San Jose, USA, January 2008, (pp. H8840).

CSB programme (AY 2008/2009)

Number of Research Projects with publications: 1 FRP and 4 IUPs

(A) Collaborative Publications with SMA-MIT Fellows

(1) FRP: Tissue Systems Biology

AY 2008/2009

Journal Publications

1. H Shi, A Li, J Yin, K S W Tan & C T Lim, "AFM study of the extracellular and the cytoplasmic surfaces of Plasmodium Falciparum infected erythrocyte membranes", American Journal of Tropical Medicine and Hygiene, Vol. 79, Issue 6, pp. 355s - 356s, 2008.

2. H W Hou, Q S Li, G Y H Lee, A P Kumar, C N Ong & C T Lim, "Deformability study of breast cancer cells using microfluidics", Biomedical Microdevices, In press 2009.

3. Le M, C Teh, S-S Ng, H Xie, B Zhou, V Korzh, H F Lodish & B Lim, "mir-125b is a novel negative regulator of p53", Genes and Development, Vol. 23, pp. 862 – 876, 2009.

4. Le M, H Xie, B Zhou, P Chia, M Um, G Udolph, H Yang, B Lim & H Lodish, "microRNA-125b Promotes Neuronal Differentiation in Human Cells by Repressing Multiple Targets", Mol. Cell. Biol, In press 2009.

5. Leptihn S, Har J Y, Chen J, Ho B, Wohland T & Ding J L, "Single molecule resolution of the antimicrobial action of QDot-Sushi peptide on live bacteria", BMC Biology, Vol. 7, pp. 22, 2009.

6. Li T, S Lim, H Shi, J Yin, K S W Tan & C T Lim, "Single molecular force spectroscopy study of Plasmodium Falciparum-infected erythrocyte cytoadherence to endothelial receptors", American Journal of Tropical Medicine and Hygiene, Vol. 79, Issue 6, pp. 348s, 2008.

7. M Marinkovic, M Diez-Silva, I Pantic, J J Fredberg, S Suresh & J P Butler, "Febrile temperature leads to significant stiffening of Plasmodium falciparum parasitized erythrocytes", Am J Physiol Cell Physiol, Vol. 296, pp. C59 - C64, 2009.

8. Q S Li, G Y H Lee, C N Ong & C T Lim, "AFM indentation study of breast cancer cells", Biochemical and Biophysical Research Communications, Vol. 374, Issue 4, pp. 609 – 13, 2008.

9. S J Tan, L Yobas, G Y H Lee, C N Ong & C T Lim, "Microdevice for the isolation and enumeration of cancer cells from blood", Biomedical Microdevices, In press 2009.

10. S R K Vedula, E Mendoz, Sun Wei, T S Lim, A Li, Q S Li & C T Lim, "Human cell as a structure and machine – An engineering perspective", IES Journal Part A: Civil and Structural Engineering, In press 2009.

11. Xie H, B Lim, & H F Lodish, "MicroRNAs Induced during Adipogenesis", That Accelerate Fat Cell Development Are Downregulated in Obesity Diabetes, Vol. 58, pp. 1050 – 1057, 2009.

12. Y K Park, M Diez-Silva, G Popescu, G Lykotrafitis, W Choi, M S Feld & S Suresh, "Refractive index maps and membrane dynamics of human red blood cells parasitized by Plasmodium falciparum", PNAS, Vol. 105, Issue 37, pp. 13730 – 13735, 2008.

Conference Publications

Low Diana H P, Le Saux Agnès, Chen Jianzhu & Ding Jeak Ling, "Role and influence of immune proteins in the formation of a pathogen-recognition network", VIII European Symposium of The Protein Society, Zurich, Switzerland, 14-18 June 2009.

(2) IUP: Advanced Imaging Informatics Technologies (AIIT)

Conference Publications

Huey Eng Chua, Andrew J-A Koo, Sourav S. Bhowmick, Hanry Yu, & C. Forbes Dewey, Jr, "Quantitative modeling of ischemia/reperfusion injury in heart and liver", Biomedical Engineering Society Annual Meeting, St. louis September 2008.

(3) IUP: Advanced Computational Image Analysis

Journal Publications

D.CS. Tai, N.Tan, S.Y. Xu, S.Chang, S.M.Chia, C.L.Cheng, A.Wee, L.W.Chiang, A.M.Raja, G. F. Xiao, J.C.Rajapakse, P.TC.So & H. Yu, "Fibro-C-Index – A comprehensive, morphology-based quantification of liver fibrosis using second harmonic generation and two-photon microscopy", Journal of Biomedical Optics, first revision submitted.

Conference Publication

1. Merlin Veronika, James Evans, Paul Matsudaira, Roy Welsch & Jagath Rajapakse, "Sub-population analysis based on temporal features from High content images", Workshop on Computational and Systems Biology (CSB 2009), Stanford, 2009; International Conference on Bioinformatics (InCoB 2009), Singapore, 2009; In progress for submission

2. Merlin Veronika, James Evans, Paul Matsudaira, Roy Welsch & Jagath Rajapakse, "Size-specific and brightness weighted cell tracking in tissues", 5th International Symposium on Nanomanufacturing (ISNM-5) and SMA International Conference 2008, Technical Parallel Session on Computation and Systems Biology, In Poster book pp 22 (Abstract), 2008.

3. Merlin Veronika, James Evans, Paul Matsudaira, Roy Welsch & Jagath Rajapakse, "Size-specific and brightness weighted cell tracking in 2D images", 12th Annual International Conference on Research in Computational Molecular Biology (RECOMB 2008), In poster book of pp 256-257, 2008.

4. Merlin Veronika, James Evans, Paul Matsudaira, Roy Welsch & Jagath Rajapakse, "Classification of Cell Morphologies Based on Kinetic Features", The 10th SMA Symposium in Singapore, Technical Parallel Session on Computation and Systems Biology, In Abstract book pp 14. (Abstract), 2009.

SINGAPORE-MIT ALLIANCE
SMA-2 PUBLICATIONS

CSB programme (AY 2008/2009)

(B) Non-collaborative publications

(1) FRP: Tissue Systems Biology

AY 2008/2009

Journal Publications

1. Li Z, C Wen, J Peng, V Korzh & Z Gong, "Generation of living color transgenic zebrafish to trace somatostatin-expressing cells and endocrine pancreas organization", Differentiation, Vol. 77, pp. 128 – 134, 2008.

2. Li Z, V Korzh & Z Gong, "DTA-mediated targeted ablation revealed differential interdependence of endocrine cell lineages in early development of zebrafish pancreas", Differentiation, Accepted 2009.

3. Sun W, Chang S, Tai D C, Tan N, Xiao G, Tang H & Yu H, "Nonlinear optical microscopy: use of second harmonic generation and two-photon microscopy for automated quantitative liver fibrosis studies", J Biomed. Opt., Vol. 13, Issue 6, pp. 064010, 2008.

4. Talay O, Shen C-H, Chen L & Chen J, "B7-H1 (PD-L1) is required for T cell-mediated conditioning of dendritic cell maturation", Proc Natl Acad Sci USA, Vol. 106, pp. 2741 – 6, 2009.

5. Toh Y C, Zhang J, Khong Y M, Du Y, Sun W & Yu H, "Integrating sensitive quantification of hepatic metabolic functions by capillary electrophoresis with laser-induced fluorescence detection", Analyst, Vol. 133, pp. 326 – 30, 2008.

6. Wen F, Chang S, Toh Y C, Arooz T, Zhuo L, Teoh S H & Yu H, "Development of dual-compartment perfusion bioreactor for serial coculture of hepatocytes and stellate cells in poly(lactic-co-glycolic acid)-collagen scaffolds", J Biomed Mater Res B Appl Biomater, Vol. 87, pp. 154 – 62, 2008.

7. Xi Chen, Fang Fang, Yih-Cherng Liou & Huck-Hui Ng, "Zfp143 regulates Nanog through modulation of Oct4 binding", Stem Cells, Vol. 26, pp. 2759 – 2767, Nov 2008.

Conference Publications

1. Fang Fang, "Characterization of coactivators in mouse embryonic stem cells", SMA symposium, Singapore, 22 January 2009.

2. Huangming Xie, Bing Lim & Harvey F Lodish, "Genomic profiling of adipocyte and preadipocyte microRNAs reveals deregulated microRNA expression in obese mice", Joint RECOMB Satellite Conference on Regulatory Genomics-Systems Biology-DREAM3, MIT, Cambridge, MA. 29 October – 2 November 2008.

3. Huangming Xie, Bing Lim & Harvey F Lodish, "Genomic profiling of microRNA reveals deregulated microRNA expression associated with chronic inflammatory environment in obese adipose tissue", NIDDK Workshop on "Dynamic Epigenome and Homeostatic Regulations in Health and Disease", Bethesda, MD 13 – 14 November 2008.

4. M BARCH, M J Lang & P T Matsudaira, "Mapping cell adhesion patterns with a modified DNA hairpin", Biophysical Society 53rd Annual Meeting, Boston, MA, February 2009.

5. MATSUDAIRA P, "The interplay between cell adhesion and ECM stiffness in the migration of single cells and epithelia", 9th Sino-Singapore Symposium, Kumming, China; 4th Singapore-India Joint Conference, Chennai, India; International Congress for BIomedical Engineering, Singapore.

6. MATSUDAIRA P, "The mechanics of cell migration on 2D and in 3D matrices", EMBO Workshop, Biopolis, Singapore.

7. Ng V Horodincu, J Rajapakse, R Welsch, P Matsudaira & J Evans, "Statistical Analysis of Drug Treated Cell Morphologies from HCS Image Data", Human Genome Organization Workshop in Genomic Sciences, High Content Cellular Screening (HCCS2008), 2008; SMA International Conference 2009, 2009; Third IAPR International Conference on Pattern Recognition in Bioinformatics (PRIB 2008), 2008; Supplementary Proceedings, pp. 257 – 260.

8. WONG Shek Yoon, CHIAM Keng Hwee & Matsudaira P, "Two-Dimensional Model of Cell Positioning and Directed Migration in the Intestinal Crypt Epithelium", Second International Mechanobiology Workshop, 2008; Keystone Symposium on Stem Cells, Cancer and Aging, Singapore, 2008.

9. WONG Shek Yoon, CHIAM Keng Hwee & Matsudaira P, "Computational Model of Epithelial Cell Translocation in the Intestinal Crypt", Joint Conference of the Society for Mathematical Biology and the Chinese Society for Mathematical Biology, Hangzhou, China, 2009; The Singapore-MIT Alliance (SMA), 10th Anniversary Symposium, Singapore, 2009.

(2) IUP: Advanced Imaging Informatics Technologies (AIIT)

Conference Publications

1. A Koo, J Sakai, G Garcia-Cardena & C F Dewey Jr, "Distortion of the Endothelial Glycocalyx by Fluid Shear Stress Leads to Increase in NO Production", Biomedical Engineering Society Annual Meeting, St. louis, September 2008.

2. E Sciacca, V A S Ayyadurai & C F Dewey Jr, "A Web Based Application for the Integration of Quantitative Molecular Pathway Simulations", Biomedical Engineering Society Annual Meeting, St. louis, September 2008.

3. H Huang, J Sakai, J Sankaran, M Bawendi & C F Dewey Jr, "Three-Dimensional Motion of Endothelial Glycocalyx Components Subjected to Oscillating Shear" Biomedical Engineering Society Annual Meeting, louis, September 2008; Bioengineering 08, Imperial College, London 17-18 Sept 2008 (Invited paper).

4. J Sakai, J Sankaran, G Garcia-Cardena & C F Dewey Jr, "Reconstitution of Hydrodynamically Relevant Endothelial Glycocalyx Following Enzyme Injury", Biomedical Engineering Society Annual Meeting, St. louis, September 2008.

5. Zhou Yong, Sourav S Bhowmick, E Leonardi, K Widjanarko, "XBLEND: Visual XML Query Formulation Meets Query Processing", In the Proceedings of the 25th IEEE International Conference on Data Engineering (ICDE 2009), IEEE CS, Shanghai, China March 2009.

(3) IUP: Advanced Microscopy for Bioinformatics

Journal Publications

1. Cha J W, Ballesta J & So P T C, "Shack-Hartmann Wavefront Sensor Based Adaptive Optics System for Multiphoton Microscopy", Opt. Exp., Submitted.

2. Chia S M, Tan N, Venkatraman L, Chang Shi, Kuan F-y. Tucker-Kellogg L, So P T C, Bhowmick S S, Dewey F C Jr., Shen S & Yu H, "Thrombospondin-1 and Plasmin Interplay in TGF-β1 Activation for Regulation of Liver Fibrosis and Regression", Nature Medicine, In preparation.

3. Gaige T A, Kwon H S, Dai G, Cabral V C, Wang R, Nam Y S, Engelward B P, Wedeen V J, So P T C & Gilbert R J, "Multiscale structural analysis of mouse lingual myoarchitecture employing diffusion spectrum magnetic resonance imaging and multiphoton microscopy", J. Biomed. Opt., Vol. 13, pp. 064005, 2008.

4. Kim D, Choi H, Yazdanfar S & So P T C, "Ultrafast optical pulse delivery with fibers for nonlinear microscopy", Microsc Res Tech, Vol. 71, pp. 887 – 96, 2008.

5. Kojic N, Huang A, Chung E, Tschumperlin D & So P T C, "Quantification of three-dimensional dynamics of intercellular geometry under mechanical loading using a weighted directional adaptive-threshold method", Opt Express, Vol. 16, pp. 12403 – 14, 2008.

6. Kwon H S, Nam Y S, Wiktor-Brown D M, Engelward B P & So P T C, "Quantitative morphometric measurements using site selective image cytometry of intact tissue", Roy. Soc. Interface, Vol. 6, pp. S45 – 57, 2009.

7. Lee W A, Chen J L, Huang H, Leslie J H, Amitai Y, So P T C & Nedivi E, "A Dynamic Zone Defines Interneuron Remodeling in the Audit Neocortex", PNAS, Vol. 105, pp. 19968 – 73, 2008.

8. Rahim N A A, McDaniel W, Bardon K, Srinivasan S, Vickerman V, So P T C & Moon J H, "Conjugated Polymer Nanoparticles for Two-photon Imaging of Endothelial Cells in a Tissue Model", Advanced Materials, In Press.

9. Wiktor-Brown D M, Kwon H S, Nam Y S, So P T C & Engelward B P, "Integrated one- and two-photon imaging platformreveals clonal expansion as a major driver of mutation load", PNAS, Vol. 105, pp. 10314 – 9, 2008.

10. Yew E Y S, "Performance parameters for focusing of radial polarization", Opt. Lett., Vol. 33, Issue 5, pp. 497 – 499, 1 March 2008.

11. Yew E Y S & Sheppard C J R, "Fractional Gouy phase", Opt. Lett., Vol. 33, pp. 1363 – 1365, 15 June 2008.

Conference Publication

1. Balla N K & Sheppard C J R, "Gold nanoparticles as second harmonic contrast agents for imaging live cells", Focus on Microscopy (FOM08), Awaji Yumbetai International Conference Center, Awaji Island, Japan, 13 – 16 April (pp. 45).

2. D Kim & Peter T C So, "3D Lithographic microfabrication System with Two-Photon Excitation Induced by Wide-Field Illumination", Biomedical Optics Topical Meetings, March 2008; Gordon Research Conference, St. Petersburg, FL, July 2008; Laser in Medicine and Biology, Holderness School, NH, July 2008.

3. D Kim & Peter T C So, "High-Speed Imaging and Fabrication Based on Ultrafast Optical Pulse Manipulation", Photonics West 2009, BiOS 2009, San Jose, CA, January 2009.

4. Daekeun Kim & Peter T C So, "Axial resolution for two-photon wide-field illumination microscopy and microfabrication", Proceedings of SPIE, BIOS, January 2008; 6860, Multiphoton Microscopy in the Biomedical Sciences VIII, pp. 686028, SPIE, San Jose, CA, January 2008.

5. H Choi, S-C Chen, M L Culpepper & Peter T C So, "Characterization of a Multiphoton Endomicroscope for Early Cancer Diagnosis", Biomedical Optics Topical Meetings (Received Best Poster presentation Award), Gordon Research Conference, March 2008; St. Petersburg, FL, July 2008; Laser in Medicine and Biology, Holderness School, NH, July 2008.

6. J W Cha & Peter T C So, "Reassignment of Scattered Emission Photons in Multifocal Multiphoton Microscopy", Photonics West 2009, BiOS 2009, San Jose, CA, January 2009.

7. J W Cha, J Ballesta & Peter T C So, "A Shack-Hartmann Wavefront Sensor Based Adaptive Optics System for Multiphoton Microscopy", Biomedical Optics Topical Meetings, St. Petersburg, FL, March 2008; Gordon Research Conference, Laser in Medicine and Biology, Holderness School, NH, July 2008; BiOS 2009, SPIE, San Jose, CA, January 2009.

8. Peter T C So, "Advances in Optical Imaging for Neurobiology", MIT-Portugal Program, Lisbon, Portugal, January 2008.

9. Peter T C So, "Multiphoton Microscopy", Multiphoton Microscopy Short Course, BIOS, Photonic West, SPIE, San Jose, CA, January 2009.

10. Peter T C So, "High Throughput, High Content 3D Tissue Cytometry", New Frontiers in Micro And Nano Photonics, Florence, Italy, April 2008; ISAC XXIV International Congress, Budapest, Hungary, May 2008; Microscopy & Microanalysis 2008, Albuquerque, NM, August 2008; European Microscopy Conference, Aachen, Germany, September 2008; 1st International Theodor Forster Lecture Series On Quantitative Microscopy, Cambridge University, Cambridge, UK, June 2008; OWLS 10, Singapore, July 2008.

11. Peter T C So, "A 3D Two-Photon Lithographic Microfabrication System", Idea Stream Symposium, Deshpande Center, MIT, Boston, MA, April 2008.

12. Peter T C So, "Advances in High Content Biomolecular Imaging", 11th Annual Future of Light Symposium – Biophotonics, Photonics Center, Boston University, Boston, MA, June 2008.

13. Peter T C So, "Monitoring Mechano-Induced Protein Interaction Using FLIM-FRET & FCS", 3rd Workshop on Advanced Multiphoton and Fluorescence Lifetime Imaging Techniques, Saarland University, Saarbrucken, Germany, June 2008.

14. Peter T C So, "Effects of Mechanotransduction on Focal Adhesion Protein Interactions, Cellular Analysis: Linking Quantitation To Structure And Function", Pre-Meeting Congress X01, Microscopy & Microanalysis 2008, Albuquerque, NM, August 2008; Gordon Conference on Integrin, Fibronectin & Related Molecules, Ventura, CA, February 2009; 7th International Weber Symposium, Kauai, HI, June 2008.

15. Peter T C So, "Advances in high resolution, high content biomolecular imaging: Mechanotransduction of Focal Adhesion Protein Interactions", Visualizing Chemistry: Advances in Chemical Imaging Symposium, ACS Annual Meeting, Philadelphia, PA, August 2008.

16. Peter T C So, "Imaging Intracellular Protein Binding During Mechanotransduction   Electrical Engineering Biophotonics Workshop", University of California, Los Angeles, CA, October 2008.

17. Peter T C So, "Cell & Tissue Bioinformatics: High Throughput, High Content Image cytometry", ILP Japan Symposium, Hitachi Inc. & Nikon Inc., Tokyo, Japan, January 2009.

18. Peter T C So, "Quantifying Mechanotransduction Effects on Focal Adhesion Protein Interactions: A FLIM-FRET/FCS Study", Fluorescence Subgroup Meeting Symposium, Biophysical Society Annual Meeting, Boston, MA, March 2009; 7th & 8th Annual Workshop on FRET Microscopy, W. M. Keck Center for Cellular Imaging, University of Virginia, Charlottesville, VA, March 08 & 09; AIM Workshop, University of California, Berkeley, CA, Jan 2009.

19. Sheppard C J R, Balla N K & Rehman S, "Performance parameters for highly -focused electromagnetic waves", Opt. Commun., Vol. 282, Issue 5, pp. 727 – 734, 1 March 2009.

20. Yew E Y S & Sheppard C J R, "Resolution of Bessel-Gauss radially polarized beams in second harmonic generation microscopy", Focus on Microscopy FOM08, Awaji Yumbetai International Conference Center, Awaji Island, Japan, 13 - 16 April 2008, p. 44.

21. Y-H Kim, Euiheon C, Xihua Wang, Hatice A, Peter T C So & s Erramilli' "Super-resolution Imaging And Lithography By Interfering Surface Plasmon Waves", Biophysical Society 52nd Annual Meeting, Long Beach, CA, February 2008.

(4) IUP: Techniques for, and applications of, Mass-Action

Conference Publications

SINGAPORE-MIT ALLIANCE
SMA-2 PUBLICATIONS

1. J White, "Reduction for Computing Cell-Averaged Behavior from Biochemical Kinetics Models", SIAM topical meeting on Computational Science and Engineering, Miami, March 2009.

2. S Kuo, B Tidor & J White, "A Meshless, Spectrally-Accurate Integral Equation solver for Molecular Electrostatics", Special issue joint issue of the ACM Journal of Emerging Technologies in Computing Systems (JETC) and the ACM Transaction on Design Automation of Electronic Systems (TODAES), April 2008.

(5) IUP: Advanced Computational Image Analysis

Journal Publications

1. B. Zheng & J. C. Rajapakse, "Time-efficient diffusion-tensor MRI acquisition parameters for robust estimation of fiber tracts", Journal of Signal Processing Systems, Vol. 54, Issue 1 – 3, pp. 25 – 31, 2009.

2. Iti Chaturvedi & J. C. Rajapakse, "Fusion of gene regulatory and protein interaction networks using skip-chain models", Pattern Recognition in Bioinformatics, pages 214 – 224, 2008.

3. J. C. Rajapakse & S. L. Ho, "Markov/neural model for eukaryotic promoter recognition", Machine Learning in Bioinformatics, J. C. Rajapakse & Y. Zhang (Eds.), John Wiley and Sons, 2009.

4. J. C. Rajapakse, W. Yang, X. Zheng, & J. Zhou, "Probabilistic Framework for brain connectivity from functional MR images", IEEE Transactions on Medical Imaging, Vol. 27, No. 6, pp. 825-833, 2008.

5. J. Cheng & J. C. Rajapakse, "Segmentation of clustered nuclei with shape markers and marking function", IEEE Transactions on Biomedical Engineering, Vol. 56, Issue 3, March 2009.

6. J. Ma, M. N. Nguyen, & J.C. Rajapakse, "Gene classification using codon usage and support vector machines", IEEE Transactions on Computational Biology and Bioinformatics, Vol. 6, No. 1, pp. 134 – 143, January - March 2009.

7. J. Zhou & J. C. Rajapakse, "Fuzzy approach to incorporate hemodynamic variability and contextual information for detection of brain activation", Neurocomputing, Vol.71, Issue 16 – 18, pp. 3184 – 3192, 2008.

8. P. Mundra & J. C. Rajapakse, "Support Vector Based T-Score for Gene Ranking", M. Chetty, A. Ngom and S. Ahmad (Eds.), Pattern Recognition in Bioinformatics 2008, Lecture Notes in Bioinformatics, LNBI 5265, pp. 144-153, 2008.

9. R. Menjoge & R.E. Welsch, "A Diagnostic Model for Simultaneous Feature Selection and Outlier - Identification in Linear Regression", Computational Statistics and Data Analysis, submitted 2009.

10. R. Menjoge & R.E.Welsch, "Comparing and Visualizing Gene Selection and Classification Methods for Microarray Data", Chapter 2 of Machine Learning in Bioinformatics edited by J. Rajapakse and Y. Zhang, pp. 47 – 68, 2009.

11. T. Nguyen & R.E. Welsch, "Robust Regression Using Semi-Definite Programming", Computational Statistics and Data Analysis, submitted 2009.

12. U. Amato, A. Antoniadis, A. Samarov, & A. Tsybakov, "Noisy Independent Factor Analysis Model for Density Estimation and Classification", the Journal of American Statistical Association, submitted, March 2009.

Conference Publication

1. J. C. Rajapakse, "SVM-RFE for Gene Selection for Cancer Classification", First Singapore Symposium on Computational Biology (SYMBIO 2008), 1st August 2008, (Invited Talk).

2. J. Cheng, Esther G. L. Koh & J. C. Rajapakse, "3D Simultaneous Cell Motion Estimation and Segmentation", the 4th IAPR International Conference on Pattern Recognition in Bioinformatics (PRIB 2009), to be submitted.

3. J. Cheng, J. C. Rajapakse & Esther G. L. Koh, "An Automatic Approach for Dendrite Detection in 3D Microscopic Images", The Singapore-MIT Alliance (SMA) 10th Anniversary Symposium, 2009.

4. M N Nguyen, J M Zurada & J C Rajapakse, "Extracting Decision Rules in Predicting of Protein Secondary Structure", Proc. of the 8th IEEE International Conference on BioInformatics and BioEngineering (IEEE BIBE 2008), Athens, Greece, 8-10 October 2008.

5. R.E. Welsch, "Penalized Robust Methods for Variable Selection and Data-Mining", MIT Center for Biomedical Innovation Workshop on Drug Safety Surveillance: Translating Knowledge from Other Industries, Cambridge, MA 2008.

6. S. Zhu, P. Matsudaira & J. C. Rajapakse, "Analyzing GFP-tagged Cytoskeletal Protein Colocalization in Hela Cells", SMA symposium 2009.

7. Xu S.Y., He Y.T., Tai D.C.S., Kang A.C.H., Rajapakse J.C & Yu,H, "Quantification of liver fibrosis from liver surface with second harmonic generation microscopy", 2nd Mechanobiology Workshop 2008, Singapore, 3 – 5 November 2008.

8. Y. Zhang & J. C. Rajapakse, "(Eds.) Machine Learning in Bioinformatics", Wiley and Sons, Inc., USA, ISBN 978-0-470-11672-3, 456 pages, January 2009.

SINGAPORE-MIT ALLIANCE
SMA-2 PUBLICATIONS

CE programme (AY 2008/2009)

Number of Research Projects with publications: 1 FRP and 3 IUPs

(A) Collaborative Publications with SMA-MIT Fellows

(1) FRP: Design-Simulate-Fabricate Micro-/Nano-fluidics for Cell and Biomolecule Manipulation

AY 2008/2009

Journal Publications

1. Cui H H, Voldman J, He X F & Lim K M, "Separation of particles by pulsed dielectrophoresis", Lab on a Chip, Accepted 2009.

2. Li Z R, Liu G R & Han J, et al, "Transport of biomolecules in asymmetric nanofilter arrays", ANALYTICAL AND BIOANALYTICAL CHEMISTRY, Vol. 394, Issue 2, pp. 427 – 435, MAY 2009.

Conference Publications

1. Cui H H, Lim K M & Voldman J, "Pillar Array Micro-traps with Negative Dielectrophoresis", The 12th International Conference on Miniaturized Systems for Chemistry and Life Sciences (MicroTAS), 10-2008.

2. Li Z R, Liu G R, Han J, Wang J-S & Chen Y Z, "The role of configurational entropy in molecular sieving through the nanofilter arrays", The 1st International Conference of the Chinese Society of Micro/Nano Technology, 11-2008.

3. Patrick Abgrall, Jongyoon Han & Hansen Bow, "Microfabricated Slits in Series: A Simple Platform to Probe Differences in Cell Deformability", MicroTAS 2008, San Diego, CA, 10-2008 (Proceeding Vol. 2 , pp. 1199 – 1201).

4. Robinson T, Ooi B H, Taff B, Willcox K & Voldman J, "Surrogate-Based Optimization of a Microfluidic Weir Structure for Single-Cell Manipulation", 12th AIAA/ISSMO Multidisciplinary Analysis and Optimization Conference, 09-2008.

(2) IUP: Effective Computation: Reduced Order Models and Uncertainty Management in Numerical Simulations

Journal Publications

Duong-Hong D, Han J, Wang J S, Hadjiconstantinou N G, Chen Y Z & Liu G R, "Realistic simulations of combined DNA electrophoretic flow and EOF in nano-fluidic devices", Electrophoresis, Vol. 29, Issue 24, pp. 4880 – 4886, December 2008.

Conference Publications

R Yapalparvi, Dominic D, J Chandar & M Damodaran, "Prediction of Unsteady Flow Fields and Trajectories of Tumbling Plates Using Reduced Order Modeling", The 47th AIAA Aerospace Sciences Meeting and Exhibit, Orlando, FL, USA, 5 – 8 January 2009, (AIAA-2009-329).

(3) IUP: Advanced Optimization Methods: Theory and computation for Band-Gap Optimization and Other Emerging Applications

Journal Publications

Abby Men, Ngoc-Cuong Nguyen, Jaime Peraire & Pablo Parrilo, "Band Gap Optimization of Two-Dimensional Photonic Crystals using Semi-Definite Programming", Journal of Computational Physics, Submitted, (Targeted).

(4) IUP: Robust Optimization: A Tractable Approach to Address Optimization and Equilibrium Problems Under Uncertainly

Journal Publications

D. Bertsimas, XV Doan, K. Natarajan & CP-Teo, "Models for Minimax Stochastic Linear Optimization Problems with Risk Aversion", Submitted 2009.

SINGAPORE-MIT ALLIANCE
SMA-2 PUBLICATIONS

CE programme (AY 2008/2009)

(B) Non-collaborative Publications

(1) FRP: Design-Simulate-Fabricate Micro-/Nano-fluidics for Cell and Biomolecule Manipulation

AY 2008/2009

Journal Publications

1. B M Taff, S P Desai & J Voldman, "Electroactive hydrodynamic weirs for microparticle manipulation and patterning", Applied Physics Letters, Vol. 94, pp. 084102 – 3, 2009.

2. Carlos Coelho, L M Silveira & J White, "Efficient Tools for the Calculation of Drag Forces on Planar Microelectromechanical Systems", IEEE/ASME Journal on Microelectromechanical Systems, Vol. 17, no. 3, pp. 558 – 572, 2008.

3. Cui H H & Lim K M, "Pillar array micro-traps with negative dielectrophoresis", Langmuir, Vol. 25, pp. 3336 – 3339, 2009.

4. Gregg A Radtke & Nicolas G Hadjiconstantinou, "Variance-reduced particle simulation of the Boltzmann transport equation in the relaxation-time approximation", Physical Review E, Vol 79, To appear.

5. Hansen Bow, Jianping Fu & Jongyoon Han, "Decreasing effective nanofilter size by modulating electrical double layers: Separation enhancement in microfabricated nanofilters", Electrophoresis, Vol. 29, pp. 1 – 6, 11-2008.

6. He X F, Lim K M & Lim S P, "Fast BEM solvers for Poisson-type equations", Computer Methods in Engineering and Sciences, Vol. 35, pp. 21 – 48, 2008.

7. He X F, Lim K M & Lim SP, "A fast elastostatic solver based on fast Fourier transform on multipoles (FFTM)", International Journal for Numerical Methods in Engineering, Vol. 76, pp. 1231 – 1249, 2008.

8. Jianping Fu, Pan Mao & Jongyoon Han, "Artificial molecular sieves and filters: a new paradigm for biomolecule separation", Trends in Biotechnology, Vol. 26, Issues 6, pp. 311 – 320, 06-2008 (not included in the last report).

9. M T H Reid, A W Rodriguez, J White & S G Johnson, "Efficient Computation of Casimir Interactions between Arbitrary 3D Objects", Arxiv, arXiv:0904.0741, preprint 2009.

10. S P Desai, D M Freeman & J Voldman, "Plastic masters - rigid templates for soft lithography", Lab on a Chip, In press 2009.

11. Tan Z J, Le D V, Li Z, Lim K M & Khoo B C, "An Immersed Interface Method for Solving Incompressible Viscous Flows with Piecewise Constant Viscosity Across a Moving Elastic Membrane", Journal of Computational Physics, Vol. 227, pp. 9955 – 9983, 2008.

12. Tan Z J, Le D V, Lim K M & Khoo B C, "An immersed interface method for the incompressible Navier-Stokes equations with discontinuous viscosity across the interface", SIAM Journal on Scientific Computing, Vol. 31, pp. 1798 – 1819, 2009.

13. Tan Z J, Lim K M, Khoo B C & Wang D, "An Indirect-Forcing Immersed Boundary Method for Incompressible Viscous Flows with Interfaces on Irregular Domains", Communications in Computational Physics, Vol. 6, pp. 997 – 1021, 2009.

14. Wang R, Wang J S, Liu G R & Chen YZ et al, "Simulation of DNA Electrophoresis in Systems of Large Number of Solvent Particles by Coarse-Grained Hybrid Molecular Dynamics Approach", JOURNAL OF COMPUTATIONAL CHEMISTRY, Vol. 30, Issue 4, pp. 505 – 513, MAR 2009.

SINGAPORE-MIT ALLIANCE
SMA-2 PUBLICATIONS

Conference Publications

1. Cui H H & Lim K M, "Micro-pillar barriers for guiding and sorting droplets", 15th International Conference on Solid-State Sensors, Actuators and Microsystems, Transducer 2009, NUS, 09-2009.

2. Husain A, Al-Mohssen & Nicolas G Hadjiconstantinou, "Yet Another Variance Reduction Method for Direct Monte Carlo Simulations of Low-Signal Flows", 26th International Symposium on Rarefied Gas Dynamics, Kyoto, Japan (MIT), 07-2008.

3. J H Lee & J White, "Complex-Domain Mapping for Evaluating Troublesome Integrals in Fast Full-Wave Integral Equation Solvers", Proceedings of the IEEE International Microwave Symposium, Atlanta, GA, MIT, 06-2008 (not included in last year's report).

4. J White, "Reduction for Computing Cell-Averaged Behavior from Biochemical Kinetics Models",2009 SIAM Conference on Computational Science and Engineering, MIT, 2009.

5. L Zhang, J H Lee, A Farjadpour, J White & S Johnson, "A Novel Boundary Element Method with Surface Conductive Absorbers for 3-D Analysis of Nanophotonics", Proceedings of the IEEE International Microwave Symposium, Atlanta, GA, MIT, 06-2008 (not included in last year's report).

6. Lim K M, He X F & Lim S P, "A fast boundary element method for Stokes flow", 22nd International Congress of Theoretical and Applied Mechanics, NUS, 08-2008.

7. M D Vahey & J Voldman, "High-throughput characterization of electrical phenotype using iso-dielectric separation", Biomedical Engineering Society Annual Meeting, MIT, 2008.

8. M D Vahey & J Voldman, "Sorting concentrated suspensions: particle interactions and microfluidic separations", Biomedical Engineering Society Annual Meeting, MIT, 2008.

9. Michael R Allshouse & Nicolas G Hadjiconstantinou, "Low-variance Deviational Monte Carlo Simulations of Pressure-driven Flow in Micro- and Nanoscale Channels", 26th International Symposium on Rarefied Gas Dynamics, Kyoto, Japan (MIT), 07-2008.

(2) IUP: Effective Computation: Reduced Order Models and Uncertainty Management in Numerical Simulations

Journal Publications

1. Bui-Thanh T, Willcox K & Ghattas O, "Model Reduction for Large-Scale Systems with High-Dimensional Parametric Input Space", SIAM Journal on Scientific Computing, Vol. 30, No. 6, pp. 3270 – 3288, 2008.

2. Bui-Thanh T, Willcox K & Ghattas O, "Parametric Reduced-Order Models for Probabilistic Analysis of Unsteady Aerodynamic Applications", AIAA Journal, Vol. 46, No. 10, pp. 2520 – 2529, 2008.

3. Cheng Y, Liu G R, Li Z R, Lu C & Mi D, "A thermodynamic study of peptides binding to carbon nanotubes based on a hydrophobic-polar lattice model using Monte Carlo simulations", Journal of Physics D – Applied Physics, Vol. 41, pp. 5530 – 5538, 2008.

4. Cui X Y, Liu G R, Li G Y, Zhao X, Nguyen T T & Sun G Y, "A smoothed finite element method (SFEM) for linear and geometrically nonlinear analysis of plates and shells", CMES-Computer Modeling in Engineering & Sciences, Vol. 28, pp. 109 – 125, 2008.

5. Dai K Y, Liu G R & Nguyen T T, "An n-sided polygonal smoothed finite element method (nSFEM) for solid mechanics", Finite Elements in Analysis and Design, Vol. 43, pp. 847 – 860, 2007.

6. Degroote J, Vierendeels J & Willcox K, "Interpolation among reduced-order matrices to obtain parametrized models for design, optimization and probabilistic analysis", International Journal for Numerical Methods in Fluids, Accepted with minor revisions.

7. Galbally D, Fidkowski K, Willcox K & Ghattas O, "Nonlinear Model Reduction for Uncertainty Quantification in Large-Scale Inverse Problems", International Journal for Numerical Methods in Engineering, Submitted.

8. Kee B B T, Liu G R & Lu C, "A least-square radial point collocation method for adaptive analysis in linear elasticity", Engineering Analysis with Boundary Elements, Vol. 32, pp. 440 – 460, 2008.

9. Liu G R & Xu G X, "A gradient smoothing method (GSM) for fluid dynamics problems", International Journal for Numerical Methods in Fluids, Vol. 58, pp. 1101 – 1133, 2008.

10. Liu G R & Zhang G Y, "Comments on 'Upper bound solution to elasticity problems: A unique property of the linearly conforming point interpolation method (LC-PIM)", International Journal for Numerical Methods in Engineering, Vol. 76, pp. 1280 – 1284, 2008.

11. Liu G R, Zhang J, Lam K Y, Li H, Xu G, Zhong Z H, Li G Y & Han X, "A gradient smoothing method (GSM) with directional correction for solid mechanics problems", Computational Mechanics, Vol. 41, pp. 457 – 472, 2008.

12. Liu G R, Zhao X, Dal K Y, Zhong Z H, Li G Y & Han X, "Static and free vibration analysis of laminated composite plates using the conforming radial point interpolation method", Composites Science and Technology, Vol. 68, pp. 354 – 366, 2008.

13. N C Nguyen & J Peraird, "An efficient reduced-order modeling approach for nonlinear parameterized partial differential equations", Int. Journal Numer. Meth. Engng, Vol. 77, pp. 27 – 55, 2008.

14. N C Nguyen, J Peraire & B Cockburn, "An implicit high-order hybridizable Discontinuous Galerkin method for linear convection-diffusion equations", Journal Comp. Phys., Vol. 228, pp. 3232 – 3254, 2009.

15. P O Persson, J Bonet & J Peraire, "Discontinuous Galerkin solution of the Navier-Stokes equations on deformable domains", Computer Methods in Applied Mechanics & Engineering, Vol. 198, pp. 1585 – 1595, 2009.

16. V T Nguyen, J Peraire, K B Cheong & P O Persson, "A Discontinuous Galrkin front tracking method for two-phase flows with surface tension", Computers and Fluids, Submitted.

17. Wu S C, Liu G R, Zhang H O & Zhang G Y, "A Node-based Smoothed Point Interpolation Method (NS-PIM) for Three-dimensional Thermoelastic Problems", Numerical Heat Transfer Part A – Applications, Vol. 54, pp. 1121 – 1147, 2008.

18. Zhang J, Liu G R, Lam K Y, Li H, Xue G, "A gradient smoothing method (GSM) based on strong form governing equation for adaptive analysis of solid mechanics problems", Finite Elements in Analysis and Design, Vol. 44, pp. 889 – 909, 2008.

19. Zhao X, Liu G R, Dai K Y, Zhong Z H, Li G Y & Han X, "Geometric nonlinear analysis of plates and cylindrical shells via a linearly conforming radial point interpolation method", Computational Mechanics, Vol. 42, pp. 133 – 144, 2008.

Conference Publications

1. D J Willis, P O Persson, E Israeli, J Peraire, S M Swartz & K S Breuer, "Multifidelity Approaches for the Computational Analysis and Design of Effective Flapping Wing Vehicles", AIAA Conference, Reno, NV, January 2008.

2. J Ansel, C P Chan, Y L Wong, Q Zhao, A Edelman & S Amarasinghe, "PetaBricks: A Language and Compiler for Algorithmic Choice", Proceedings of the ACM SIGPLAN Conference on Programming Language Design and Implementation (PLDI), 2009, To appear.

3. Liu G R, "Combined finite element and meshfree techniques for certified solution of mechanics problems", The 3rd Asian-Pacific Congress on Computational Mechanics (APCOM 07), Kyoto, Japan, 3 – 6 December 2007.

4. Liu G R, "A weakened weak (W2) form for a unified formulation of compatible and incompatible displacement methods for solid mechanics problem", The 5th International Conference on Flow Dynamics, Sendai, Japan, 17 – 19 November 2008.

5. Liu G R & Zhang G Y, "An upper bound solution by the linearly conforming point interpolation method (LC-PIM)", International Conference on Computational Methods (ICCM 2007), Hiroshima, Japan, 4 – 6 April 2007.

6. Liu G R & Zhang G Y, "Upper and lower bounds for numerical solutions of elasticity problems using LC-PIM and FEM", International Symposium on Computational Mechanics, 30 July – 1 August 2007.

7. Ooi B H, Robinson T, Taff B, Willcox K & Voldman J, "Numerical Analysis of a Substrate Affixed Microfluidic Weir", Proceedings of the SMA Annual Symposium, Singapore, January 2009.

8. R Yapalparvi & M Damodaran, "Prediction of Unsteady Flow Fields Using Higher Order Singular Value Decomposition (HOSVD) and Bi-Orthogonal Proper Orthogonal Decomposition (BPOD)", SIAM Conference on Computational Science and Engineering, Miami, Florida, USA, 6 – 10 March 2009.

Book Chapters

Liu G R & Song C X, „Numerical Simulation of Biomems with Dielectrophoresis using Meshfree LC-PIM", Computational and experimental techniques in MEMS, 2008.

Books

1. G Strang, "An Analysis of the Finite Element Method", 2008 Edition.

2. G Strang, "Introduction to Linear Algebra", Fourth Edition, February 2009.

(3) IUP: Advanced Optimization Methods: Theory and computation for Band-Gap Optimization and Other Emerging Applications

Journal Publications

1. Alexandre Belloni, "On the Symmetry Function of a Convex Set", Mathematical Programming, Vol. 111, pp. 57 – 93, 2008.

2. Alexandre Belloni, "On the Second-Order Feasibility Cone: Primal-Dual Representation and Efficient Projection", SIAM Journal on Optimization, Vol. 19, Issue 3, pp. 1073 – 1092, 2008.

3. Alexandre Belloni, "Projective Re-Normalization for Improving the Behavior of a Homogeneous Conic Linear System", Mathematical Programming, To appear.

4. Alexandre Belloni, "A Geometric Analysis of Renegar's Condition Number, and its Interplay with Conic Curvature", Mathematical Programming, To appear.

5. Alexandre Belloni, "Equivalence of Convex Problem Geometry and Computational Complexity in Separation Oracle Model", Mathematics of Operations Research, To appear.

6. Alexandre Belloni & Santosh Vempala, "An Efficient Re-Scaled Perceptron Algorithm for Conic Systems", Mathematical Programming (MIT Operations Research Center Working Paper OR-379-06 & Sloan School of Management Working Paper 4627-06), To appear.

7. Alexandre Belloni, Matthew Selove & Duncan Simester, "Optimizing Product Line Designs: Efficient Methods and Comparisons", Management Science, Vol. 54, Issue 9, pp. 1544 – 1552, 2008.

8. D Sun & J Sun, "Loewner's operator and spectral functions in Euclidean Jordan algebras", Mathematics of Operations Research, Vol. 33, pp. 421 – 445, 2008.

9. J S Chen, D F Sun & J Sun, "The SC^1 property of the squared norm of the SOC Fisher-Burmeister function", Operations Research Letters, Vol. 36, pp. 385 – 392, 2008.

10. N Stein, A Ozdaglar & P A Parrilo, "Separable and Low-Rank Continuous Game", International Journal of Game Theory, Vol. 37, No. 4, pp. 457 – 474, 2008.

11. Z H Huang & J Sun, "A Non-Interior Continuation Algorithm for the P0 or P*-LCP ith Strong Global and Local Convergence Properties", Applied Mathematics and Optimization, Vol. 52, pp. 237 – 262, 2005.

12. Zi Xian Chan & Defeng Sun, "Constraint nondegeneracy, strong regularity and nonsingularity in semidefinite programming", SIAM Journal on Optimization, Vol. 19, pp. 370 – 396, 2008.

Conference Publications

1. P Parrilo, "Semidefinite programming and convex algebraic geometry", Foundations of Computational Mathematics 2008, Hong Kong, June 2008 (plenary lecture).

2. R Freund, "Improved Initialization of the Homogeneous Self-Dual Embedding Model for Solving Conic Convex Optimization", SIAM Conference on Optimization, Boston, USA, May 2008.

3. R Freund, "Equivalence of Computational Complexity and Geometric Properties of Convex feasibility Problem in the Separation Oracle Model", Foundations of Computational Mathematics 2008 Workshop, Hong Kong, June 2008.

(4) IUP: Robust Optimization: A Tractable Approach to Address Optimization and Equilibrium Problems Under Uncertainly

Journal Publications

1. A. Farahat & G. Perakis, "Profit Loss in Differentiated Oligopolies", Operations Research Letters, accepted in August 2008.

2. A. Farahat & G. Perakis, "Price Competition Among Multiproduct Firms", Operations Research, submitted 2008.

3. C. Wang, C.J. Ong & M. Sim, "Convergence Properties of Constrained Linear System under MPC Control Law using Affine Disturbance Feedback", Automatica, Accepted 2009.

4. C. Wang, C.J. Ong, & M. Sim, "Constrained Linear System with Disturbance: Convergence under Disturbance Feedback", Automatica, Vol. 44, Issue 10, 2008.

5. D. Bertsimas, J. Hawkins & G. Perakis, "Optimal Bidding in Online Auctions", Journal of Revenue Management and Pricing, accepted in Fall 2008.

6. D. Brown & M. Sim, "Satisficing Measures in Analysis of Risky Position", Management Science, Vol. 55, Issue 1, pp. 71-84, 2009.

7. D. Sui, L Feng & C.J. Ong, "Interpolated robust time-optimal controllers for linear systems", IET Control Theory and Applications, Vol. 2, Issue 3, pp. 219-227, 2008.

8. D. Sui, L Feng, M. Hovd & C.J. Ong, "Decomposition Principle in Model Predictive Control for Linear Systems with Bounded Disturbances", Automatica, Accepted 2009.

9. D. Sun, J. Sun & L. Zhang, "The Rate of Convergence of the Augmented Lagrangian Method for Nonlinear Semidefinite Programming", Mathematical Programming, Vol. 114, pp. 349-391, 2008.

10. E. Adida & G. Perakis, "The strategic role of capacity in a pricing game", European Journal of Operations Research, submitted 2008.

11. G. Perakis & G. Roels, "Regret in the Newsvendor Problem with Partial Information", Operations Research, Vol. 56, No. 1, pp. 188-203, January-February 2008.

12. G. Perakis & M. Zaretsky, "Multi-period Models with Capacities in Competitive Supply Chain", POMS Journal (Production and Operations Management Society Journal), Vol. 17, No. 4, July - August 2008.

13. J. Kluberg & G. Perakis, "Generalized Cournot competition for multiple products and Price of Anarchy", Operations Research, submitted 2008.

14. K. Natarajan, D. Pachamanova & M. Sim, "Incorporating Asymmetric Distributional Information in Robust Value-at-Risk Optimization", Management Science, Vol. 54, Issue 3, pp. 573 – 585, 2008.

15. K. Natarajan, M. Sim & Joline Uichanco, "Tractable Robust Expected Utility and Risk Models for Portfolio Optimization", Mathematical Finance, Accepted 2008.

16. K. Natarajan, M. Sim & Joline Uichanco, "Asymmetry and Ambiguity in Newsvendor Models", Operations Research, Submitted 2008.

17. K. Natarajan, M. Song & CP. Teo, "Persistency Model and Its Applications in Choice Modeling", Management Science, Accepted 2009.

18. K.Q.Shen, C.J. Ong, X.P.Li & E.P.V.Wilder-Smith, "Feature Selection via Sensitivity Analysis of SVM probabilistic outputs", Machine Learning, Vol. 70, Issue 1, 2008.

19. M. Ang, Y-F. Lim & M Sim, "Robust Warehouse Management", Management Science, Submitted 2009.

20. R. Levi & A. Radovanovic, "Revenue Management of Reusable Resources - Provably Near-Optimal LP-Based Policies", Operations Research, accepted 2009.

21. R. Levi, A. Lodi & M. Sviridenko, "Approximation Algorithms for the Multi-Item Capacitated Lot-Sizing Problem Via Flow-Cover Inequalities", Mathematics of Operations Research, Vol. 33 (2), pages 461-474, May 2008.

22. R. Levi, D. Shmoys & C. Swamy, "LP-based Approximation Algorithms for Capacitated Facility Location", Mathematical Programming, (extended abstract appeared in IPCO 2004), to appear in 2009.

23. R. Levi, G. Janakiraman & M. Nagarajan, "A 2-Approximation Algorithm for Stochastic Inventory Control Models with Lost-Sales", Mathematics of Operations Research (This paper was awarded the "2008 Optimization Prize for Young Researchers" by the Optimization Society, INFORMS), Vol. 33 (2), pages 351 – 374, May 2008.

24. R. Levi, J. Geunes, E. Romeijn & D. Shmoys, "Inventory and Facility-Location Models with Market Choice", Mathematical Programming, submitted 2008.

25. R. Levi, R. Roundy & V. A. Truong, "Provably Near-Optimal Balancing Policies for Stochastic Multi-Echelon Inventory Control Models", revised for Operations Research (extended abstract appeared in IPCO 2005), submitted 2008.

26. R. Levi, R. Roundy, D. Shmoys & M. Sviridenko, "First Constant Approximation Algorithm for the One-Warehouse-Multi-Retailer Problem", Management Science, Vol. 54, pages 763–776, April 2008.

27. R. Levi, R. Roundy, D. Shmoys & V. A. Truong, "Approximation Algorithms for Capacitated Stochastic Inventory Models", Operations Research, vol. 56(5), pages 1184-1199, September-October 2008.

28. T. Schoenmyer, P. F. Dunn, D. Gamarnik; R. Levi, D. L. Berger, B. J. Daily, W. C. Levine, & W. S. Sandberg, "A Model for Understanding the Impacts of Demand & Capacity on Waitlists in a Congested Recovery Room", Anesthesiology, Accepted 2009.

29. X. Chen, M. Sim, P. Sun & J. Zhang, "A Linear-Decision Based Approximation Approach to Stochastic Programming", Operations Research, Vol 56, Issue 2, pp. 344-357, 2008.

Conference Publications

1. A. Farahat & G. Perakis, "A Comparison of Price and Quantity Competition in Oligopolies with Differentiated Products", in refereed Proceedings for the MSOM Conference, Maryland, 2008.

2. C. Wang, C.J. Ong & M. Sim, "Constrained Linear System under Disturbance Feedback: Convergence with Probability One", Proc. Of Conference on Decision and Control, 2008.

3. J. Kluberg & G. Perakis, "Generalized Cournot competition for multiple products and Price of Anarchy", in refereed Proceedings for the MSOM Conference & in Proceedings for the Forty-Sixth Annual Allerton, Maryland, 2008.

4. N. Buchbinder, T. Kimbrel, R. Levi, K. Makarychev & M. Sviridenko, "Online Make-to-Order Joint Replenishment Model: Primal-Dual Competitive Algorithms (Extended Abstract)", proceedings to SODA 2008 (pages 952-961), 2008.

5. T. Huh, R. Levi, P. Rusmevichientong & J. Orlin, "Adaptive Data-Driven Inventory Control Policies Based on Kaplan-Meir Estimator", proceedings to MSOM, 2008.

SINGAPORE-MIT ALLIANCE
SMA-2 PUBLICATIONS

MST programme (AY 2008/2009)

Number of Research Projects with publications: 1 FRP and 3 IUPs

(A) Collaborative Publications with SMA-MIT Fellows

(1) FRP: Manufacturing Processes, Equipment and Controls for the Production of Polymer-based Microfluidic Devices

AY 2008/2009

Journal Publications

1. Fu G, S B Tor, N H Loh, B Y Tay & D E Hardt, "Demolding of powder injection molded micro-structures: analysis, simulation and experiment", Journal of Micromechanics and Microengineering, Vol. 18, Issue 7, Art no. 075024, 2009.

2. H K Taylor, C Iliescu, B Chen, Y C Lam, X Chen & D S Boning, "Modeling pattern dependencies in the micron-scale embossing of polymeric layers", Proc. SPIE, Vol. 7269, pp. 726909, 2008.

3. H K Taylor, D S Boning, C Iliescu & B Chen, "Computationally efficient modelling of pattern dependencies in the microembossing of thermoplastic polymers", Microelectronic Engineering, Vol. 85, pp. 1453 – 1456, 2008.

4. H K Taylor, Y C Lam & D S Boning, "A computationally simple method for simulating the micro-embossing of thermoplastic layers", Journal of Micromechanics and Microengineering, In press.

5. S B Tor, G Fu, N H Loh, B Y Tay & D E Hardt, "Metallic Mold Inserts for Fabrication of Polymer Microfluidic Devices", International Journal of Nanomanufacturing, Submitted 2009.

6. Shiguang Li, Todd Thorsen, Zhiguang Xu, Zhong Ping Fang & Soon Fatt Yoon, "Measurement of Multilayer Film Thickness of Microvalves of Microfluidics with Chromatic Confocal Microscopy", Biomedical Optics, In preparation.

7. V.Shilpiekandula, D J Burns, S Li, Z Xu, H K, Taylor, K Youcef-Toumi, Z P Fang & S F Yoon, "Fusion of Metrology Data for High-Volume Large-Scale Manufacturing of Polymer-Based Microfluidic Devices", International Journal Of Nanomanufacturing, Submitted.

8. X Zhiguang, L Shiguang, D J Burns, V Shilpiekandula, H K Taylor, S F Yoon, K Youcef-Toumi, I Reading, Z Fang, J Zhao & D S Boning, "Three-dimensional profile stitching based on the fiducial markers for microfluidic devices", Optics Communications, Vol. 282, no. 4, pp. 493 – 499, 2009.

9. Z Xu, S. Li, D J Burns, V Shilpiekandula, H K Taylor, Yoon S F, Youcef-Toumi K, Reading I, Fang Z P, Zhao J H & Boning D S, "Large-area and high-resolution distortion measurement based on moiré fringe method for hot embossing process", Optics Communications (Optics Express), Vol. 282, Issue 4, pp. 493 – 499, February 2009.

10. Z Xu, V Shilpiekandula, K Youcef-Toumi & S F Yoon, "Absolute Nanoscale Gap Thickness Measurement by a White-light Scanning Interferometer", Optics Express, Submitted for Review.

Conference Publications

1. B Saha, N W Khun, S B Tor, E Liu, D E Hardt & Chun Jung Hoon, "Structural and Tribological Properties of DLC Coatings Synthesized by dc Magnetron Cosputtering" The 7th International Conference on Materials Processing for Properties and Performance (MP3), Paper No.: AMFT-7037, 6th – 20th November 2008.

2. B Saha, S B Tor, E Liu, D E Hardt & J H Chun, "Improvement of Replication of Patterns by Using Anti-sticking DLC Coating Micromolds", The Annual SMA Symposium, Singapore, 21 – 22 January 2009.

3. D E Hardt, B W Anthony & S B Tor, "A Teaching Factory for Polymer Microfabrication", uFac, 6th International Symposium on Nanomanufacturing, Athens, Greece, 3A.2, 12th - 14th November 2008.

4. D E Hardt, B W Anthony & S B Tor, "A Teaching Factory for Polymer Microfluidic Devices", The Annual SMA Symposium,   Singapore, 21 – 22 January 2009.

5. S B Tor, G Fu, N H Loh & D E Hardt, "A Universal Development Platform for the Design and Fabrication of Polymeric Microfluidic Devices", The Annual SMA Symposium, Singapore, 21 – 22 January 2009.

6. S B Tor, G Fu, N H Loh, B Y Tay & D E Hardt, "Metallic Mold Inserts for Fabrication of Polymer Microfluidic Devices", 6th International Symposium on Nanomanufacturing, 12 - 14th November 2008 (6A.1).

7. S G Li, Z G Xu, A Mazzeo, D J Burns, G Fu, M Dirckx, V Shilpiekandula, X Chen, N C Nayak, E Wong, S F Yoon, Z P Fang, K Youcef-Toumi, D Hardt, S B Tor, C Y Yue & J H Chun, "Review of production of microfluidic devices: material, manufacturing and metrology   PROCEEDINGS OF THE SOCIETY OF PHOTO-OPTICAL INSTRUMENTATION ENGINEERS (SPIE)", Europe Photonics, Vol. 6993, pp. F9930 - F9930, Europe France, 2008.

8. Shiguang Li, Zhiguang Xu, Soon Fatt Yoon, Zhongping Fang, Hayden K Taylor, Vijay Shilpiekandula, Gang Fu, Shu Beng Tor, Todd Thorsen, Duane S Boning & Kamal Youcef-Toumi, "Measurement Activities in Production of Microfluidic Devices", SMA 10th Anniversary Symposium, 2009.

9. Taylor Hayden K, Zhiguang Xu, Li Shiguang, Kamal Youcef-Toumi, Yoon Soon Fatt & Duane S Boning, "Moire fringe method for the measurement of distortions of hot-embossed polymeric substrates", Proc. of SPIE, Vol. 7155, p715528-1-9, 2008.

10. Z Xu, V Shilpiekandula, K Youcef-toumi & S F Yoon, "A novel white-light scanning interferometer for absolute nanoscale gap thickness measurement", IEEE/LEOS International Conference on Optical MEMS and Nanophotonics, August 2009, FL.

11. Zhiguang Xu, Hayden K Taylor, Duane S Boning, Kamal Youcef-Toumi & Soon Fatt Yoon, "Image Processing Technique Based on Moiré Fringe Approach for Distortion Measurement in Hotembossing Process", SMA 10th Anniversary Symposium, January 2009.

12. Zhiguang Xu, Vijay Shilpiekandula, Kamal Youcef-Toumi & Soon Fatt Yoon, "Absolute Nano-scale Gap Thickness Measurement by a White-light Scanning Interferometer", SMA 10th Anniversary Symposium, 2009.

(2) IUP: Dynamic Pricing and Revenue Management for Air Cargo Transportation

Journal Publications

Cheong L F Michelle, Bhatnagar R & Stephen C Graves, "Logistics Network Design With Supplier Consolidation Hubs And Multiple Shipment Options", Journal of Industrial and Management Optimization (Published by the American Institute of Mathematical Sciences – Refereed), Vol. 3, Issue 1, pp. 51 – 69, 2007.

(3) IUP: Design and Planning of Supply Chains for Emerging Industries

Journal Publications

1. Teo C C, Bhatnagar R & Stephen C Graves, "An Application of Master Schedule Smoothing and Planned Lead Time Control", Production and Operations Management Journal, To be submitted, 2009.

2. Teo C C, Bhatnagar R & Stephen C Graves, "Setting for a Make to Order Production System with Master Schedule Smoothing", IIE Transactions, Submitted, 2009, pp. 37.

3. Wang Yexin, Bhatnagar R & Stephen C Graves, "A Dual-Channel Vendor-Buyer System with Minimum Purchase Commitment", Naval Research Logistics, Submitted 2008, pp. 26.

(4) IUP: Quality / Quantity Research – Empirical and Numerical Studies and Analysis

Journal Publications

1. John Benedict C Tajan, Appa Iyer Sivakumar & Stanley B Gershwin, "Control of a Single Batch Processor with Incompatible Job Families and Future Job Arrivals", IEEE Transactions on Semiconductor Manufacturing (United States), Submitted under review 2008.

2. John Benedict C Tajan, Appa Iyer Sivakumar & Stanley B Gershwin, "Control of Job Arrivals with Processing Time Windows into Batch Processors", Operations Research (United States), Submitted under review 2008.

3. John Benedict C Tajan, Appa Iyer Sivakumar & Stanley B Gershwin, "Control of multiple Batch Processors with Incompatible Job Families and Future Job Arrivals", European Journal of Operational Research (Netherlands), Submitted under review 2008.

4. John Benedict C Tajan, Appa Iyer Sivakumar & Stanley B Gershwin, "Upstream Control of Jobs with Processing Time Windows for Downstream Batch Processor", International Journal of Production Economics (Netherlands), Submitted under review 2008.

5. Qi C, Sivakumar A I & Gershwin S B, "Maintenance Scheduling for a Machine with Multiple Deteriorating Quality States", the International Journal of Machine Tools and Manufacturing, submitted 2009.

6. Qi C, Sivakumar A I & Gershwin S B, "Optimal Maintenance Scheduling for a Machine with Multiple Deteriorating Quality States based on Reinforcement Learning", Internal Journal of Production Research, To be submitted 2009.

7. Qi C, Sivakumar A I & Gershwin S B, "Impact of Production Control and System Factors in Semiconductor Wafer Fabrication", IEEE Transactions on Semiconductor Manufacturing, Vol. 21, Issue 3, art. no. 4589044, pp. 376 – 389, 2008.

8. Qi C, Sivakumar A I & Gershwin S B, "An Efficient New Job Release Control Methodology", International Journal of Production Research, Vol. 47, Issue 3, pp. 703 – 731, 2008.

Conference Publications

Tajan J B C, Sivakumar A I & Gershwin S B, "Online control of a batch processor with incompatible job families under correlated future arrivals", Proceedings - Winter Simulation Conference, art. no. 4736307, pp. 2100 – 2108, 2008.

SINGAPORE-MIT ALLIANCE
SMA-2 PUBLICATIONS

MST programme (AY 2008/2009)

(B) Non-collaborative Publications

(1) FRP: Manufacturing Processes, Equipment and Controls for the Production of Polymer-based Microfluidic Devices

AY 2008/2009

Journal Publications

1. Anand L, Nicoli M Ames, Vikas Srivastava & Shawn A. Chester, "A thermo-mechanically coupled theory for large deformations of amorphous polymers. Part I: Formulation", International Journal of Plasticity, Vol. 25, Issue 8, pp. 1474 – 1494, August 2009.

2. D J Burns, V Shilpiekandula, & K Youcef- Toumi, "An Instrument Transfer Function Approach to Atomic Force Microscopy for Surface Metrology", International Journal of Nanomanufacturing, Submitted.

3. David L Henann, "A large deformation theory for rate-dependent elastic–plastic materials with combined isotropic and kinematic hardening", International Journal of Plasticity, In Press 2009, Corrected Proof, Available online 7 December 2008.

4. Gurtin M E & Anand L, "Nanocrystalline grain boundaries that slip and separate: A gradient theory that accounts for grain-boundary stress and conditions at a triplejunction", JOURNAL OF THE MECHANICS AND PHYSICS OF SOLIDS, Vol. 56, Issue 1, pp. 184 – 199, 2008.

5. Gurtin M E & Anand L, "Thermodynamics applied to gradient theories involving the accumulated plastic strain: The theories of Aifantis and Fleck and Hutchinson and their generalization", JOURNAL OF THE MECHANICS AND PHYSICS OF SOLIDS, Vol. 57, Issue 3, pp. 405 – 421, 2009.

6. Henann D & Anand L, "A constitutive theory for the mechanical response of amorphous metals at high temperatures spanning the glass transition temperature: application to microscale thermoplastic forming", ACTA MATERIALIA, Vol. 56, Issue 13, pp. 3290 – 3305, 2008.

7. Henann D L & Anand L, "Fracture of metallic glasses at notches: effects of notch-root radius and the ratio of the elastic shear modulus to the bulk modulus on toughness", Acta Materialia, Submitted 2009.

8. Lele S P & Anand L, "A large-deformation straingradient theory for isotropic viscoplastic materials", International Journal Of Plasticity, Vol. 25, Issue 3, pp. 420 – 453, 2008.

9. Lele S P & Anand L, "A small-deformation straingradient theory for isotropic viscoplastic materials", Philosophical Magazine, Vol. 88, Issue 30 – 32, Doi: 10.1080/14786430802087031, 2008.

10. Nayak N C, Lam Y C, Yue C Y & Sinha A T, "CO_2 – Laser micromachining of PMMA: Effect of polymer molecular weight", Journal of Micromechanics and Microengineering, Vol.18, Issue 9, pp. 095020 (7pp.), 2008.

11. Nicoli M Ames, Vikas Srivastava, Shawn A Chester & Lallit Anand, "A thermo-mechanically coupled theory for large deformations of amorphous polymers. Part II: Applications", International Journal of Plasticity, Vol. 25, Issue 8, pp. 1495 – 1539, August 2009.

12. Wei Y & Anand, L, "On micro-cracking, inelastic dilatancy, and the brittle-ductile transition in compact rocks: a micromechanical study", International Journal Of Solids And Structures, Vol. 45, Issue 10, pp. 2785 – 2798, 2008.

Conference Publications

1. Brian W Anthony, Nadege Zarrouati & Dean M Ljubicic, "Photogrammetric Based Inspection of Polymer Devices", SMA Symposium, Singapore, Singapore 21 – 22 January 2009.

2. E Wong & J Chun, "Accelerated Curing and its Dimensional Effects on Microfluidic Devices", 10th Anniv. Singapore-MIT-Alliance Symposium, 2009.

3. E Wong, S Kumar, A Mazzeo, J Chun & D Hardt, "Functional Test System Design for Microfluidic Applications", 10th Anniv Singapore-MIT Alliance Symposium, 2009.

4. Nayak N C, Yue C Y & Lam Y C, "Influence of polymer molecular weight on the morphological and geometrical parameters of CO_2-laser machined PMMA", 6th International Symposium on Nanomanufacturing, Athens, Greece, 12 – 14 November 2008.

5. Vikas Srivastava & Lallit Anand, "On modeling the mechanical behavior of amorphous polymers for the micro-hot-embossing of microfluidic devices", Proceedings of ASME International Mechanical Engineering Congress, Boston, November 2008.

(2) IUP: Dynamic Pricing and Revenue Management for Air Cargo Transportation

Conference Publications

Mehta P, Bhatnagar R & Teo C C, "Planning and Scheduling Decisions in Supply Chains with Multiple Supply Modes", INFORMS Annual Conference, Washington D C, USA, 2008.

(3) IUP: Design and Planning of Supply Chains for Emerging Industries

Journal Publications

1. Bhatnagar R & Teo C C, "Role of Logistics in Enhancing Competitive Advantage: A Value Chain Framework for Global Supply Chains", International Journal of Physical Distribution and Logistics Management, Accepted 2009.

2. Kunpeng Li, Appa Iyer Sivakumar, Ganesan V K, "Complexities and Algorithms for Synchronized Scheduling of Parallel Machine Assembly and Air Transportation in Consumer Electronics Supply Chain", European Journal of Operational Research, Vol. 183, No. EOR8303, pp. 442 – 455, 2007.

3. Kunpeng Li, Sivakumar A I & Ganesan V K, "Analysis and algorithms for coordinated scheduling of parallel machine manufacturing and 3PL transportation", International Journal of Production Economics, Vol. 115, Issue 2, pp. 482 – 491, 2008.

(4) IUP: Quality / Quantity Research – Empirical and Numerical Studies and Analysis

Journal Publications

1. Amit Kumar Gupta, Appa Iyer Sivakumar & Peter Lendermann (SIMTech), "Cycle Time Simulation Study for Cluster Tool Operation in IC Fabrication", International Journal of Manufacturing Technology and Management, Accepted Feb 2009.

2. Amit Kumar Gupta, Ganesan V K & Appa Iyer Sivakumar, "Cycle Time Variance Minimization in Dynamic Scheduling of Single Machine Systems", International Journal of Advanced Manufacturing Technology, Article in Press, pp. 1 – 9, 2008.

3. Ang A T H, Sivakumar A I & Qi C, "Criteria selection and analysis for single machine dynamic on-line scheduling with multiple objectives and sequence-dependent setups", Computers and Industrial Engineering, Article in Press, 2008.

4. Ang A T H, Sivakumar A I & Qi C, "Look-Ahead Simulation-Based Genetic Algorithm with Desirability Function for Multi-objective Scheduling", submitted to IEEE Transactions on Semiconductor Manufacturing, Submitted under review 2009.

5. Qi C & Sivakumar A I, "A Literature Review on Job Release Control", International Journal of Advanced Manufacturing Technology, To be submitted 2009.

Conference Publications

1. Gupta A K, Lendermann P, Sivakumar A I & Priyadi J, "Simulation analysis of cluster tool operations in wafer fabrication", Proceedings - Winter Simulation Conference, art. no. 4736312, pp. 2141 – 2147, 2008.

2. Sivakumar A I, Qi C & Hidayat A D K, "Experimental study on variations of wipload control in semiconductor wafer fabricaiton environment", Proceedings - Winter Simulation Conference, art. no. 4736299, pp. 2035 – 2040, 2008.

SINGAPORE-MIT ALLIANCE
SMA-2 PUBLICATIONS

CPE programme (AY 2008/2009)

Number of Research Projects with publications: 1 FRP and 2 IUPs

(A) Collaborative Publications with SMA-MIT Fellows

(1) FRP: Molecular Engineering of Bio / Chemical Pathways & Process Science for the Pharmaceutical Industry

AY 2008/2009

Journal Publications

1. R Sondjaja, T A Hatton & M K-C Tam, "Clustering of Magnetic Nanoparticles Using a Double Hydrophilic Block Copolymer, Poly(thyleneoxide)-b-Poly(acrylicacid)", Journal of Magnetism and Magnetic Materials, In Press.

2. S H Lee, T A Hatton & S A Khan, "Microfluidic continuous magnetophoretic protein separation", Lab on a Chip, In preparation.

3. S Sun, K Wang, D Rajarathnam, T S. Chung & T A Hatton, "Polyamide-imide Nanofiltration Hollow Fiber Membranes with Elongation-Induced Nano-pore Evolution", AIChE Journal, submitted.

4. T Y Nee, J Y Lee & D I C Wang, "Aspartic Acid Synthesis of Crystalline Gold Nanoplates, Nanoribbons and Nanowires in Aqueous Solutions", Journal of Physical Chemistry C, Vol. 112, Issue 14, pp. 5463 – 5470, December 2008.

5. Watson Donald A, Fan Xuexiang Buchwald & Stephen L, "Carbonylation of Aryl Chlorides with Oxygen Nucleophiles at Atmospheric Pressure. Preparation of Phenyl Esters as Acyl Transfer Agents and the Direct Preparation of Alkyl Esters and Carboxylic Acids", J. Org. Chem., Vol. 73, pp. 7096 – 7101, 2008.

6. Wei Zhang, Kevin O' Connor, Daniel I C Wang & Zhi Li, "Efficient Recycling of NADPH in Enantioselective Bioreduction With Coupled Permeabilized Microorganisms", Applied and Environmental Microbiology, Vol. 75, pp. 687 – 694 (Highlighted in Microbe Magazine), Feb 2009.

7. Wen Wang, Yi Xu, Daniel I C Wang & Zhi Li, "Chloroperoxidase Immobilized on Functionalized Core/Shell Magnetic Nanoparticles as High-performance Recyclable Nano-biocatalyst for Enantioselective Sulfoxidation", small, to be submitted in mid of may 2009.

8. Yusdy, Sohan R Patel, Miranda GS Yap & Daniel I C Wang, "Immobilization of L-Lactate Dehydrogenase on Magnetic Nanoclusters for Chiral Synthesis of Pharmaceutical Compounds", Biochemical Engineering Journal, Submitting (under revision); Manuscript submitted and reviewed (Revision in progress for publication).

9. Z Zhou, Y Xiao, T S Chung & T A Hatton, "Effect of spacer arm length and benzoation on enantioseparation performance of β-cyclodextrin functionalized cellulose membranes", J. Membr. Sci , In press.

Conference Publications

1. Tang Y C, Stephanopoulos G & Too H P, "Information theory-based analysis for optimization of biological signal-response data", Joint 5th Structural Biology and Functional Genomics and 1st Biological Physics International Conference, 9 – 11 December 2008 (award for poster presentation).

2. Wei Zhang, Daniel I C Wang & Zhi Li, "Bioreduction with Efficient Recycling of NADPH by Coupled Permeabilized Microorganisms", SMA 10th Anniversary Symposium, Singapore, Jan 2009.

3. Wei Zhang, Kevin O' Connor, Daniel I C Wang & Zhi Li, "Bioreduction by Coupled Permeabilized Microorganisms", Biocat 2008, Hamburg, Germany, Sep 2008.

4. Wen Wang, Daniel I C Wang & Zhi Li, "Immobilization of Chloroperoxidase on Functionalized Iron Oxide Core-Shell Magnetic Nanoparticles for Efficient Biocatalysis", SMA 10th Symposium, Singapore, Jan 2009.

5. Yusdy, Sohan R Patel, Miranda G S Yap & Daniel I C Wang, "Covalent Immobilization of Enzymes on Magnetic Nanoclusters: A Study on the Effect of Surface Interactions", Nanotech Insight 09, UAB, Barcelona, March 2009.

6. Yusdy, Sohan R Patel, Miranda Yap & Daniel I C Wang, "Magnetic Nanoclusters for Biocatalysis and Co-factor Regeneration", 2009 SMA Symposium, Poster Presentation, Singapore, January 2009.

7. Zhi Li, Wei Zhang, Kevin O' Connor & Daniel I C Wang, „Enantioselective Bioreduction of Ketone with Cofactor Recycling by the use of Coupled Permeabilized Microorganisms", AIChE Annual Meeting & Centennial Celebration, Philadelphia, USA, Nov 2008.

(2) IUP: High Through-Put Sensing of Biological and Chemical Systems

Journal Publications

1. Tan H K, M M Lee, M G S Yap & D I C Wang, "Over-Expression of Cold-Inducible RNA-Binding Protein (CIRP) Increases Interferon-γ Production in CHO Cells", Biotechnology and Applied Biochemistry, pp. 247 – 257, July 2008.

2. Xie J, Zhang Q, Lee J Y & Wang D I C, "General Method for Metal Nanowire Synthesis: Ethanol Induced Self-Assembl", Journal of Physical Chemistry C, 2007.

SINGAPORE-MIT ALLIANCE
SMA-2 PUBLICATIONS

CPE programme (AY 2008/2009)

(B) Non-collaborative Publications

(1) FRP: Molecular Engineering of Bio / Chemical Pathways & Process Science for the Pharmaceutical Industry

AY 2008/2009

Journal Publications

1. Bong K W, Pregibon D C & Doyle P S, "Lock release lithography for 3D and composite microparticles", Lab Chip, Submitted 4-09, Features on inside cover and a "hot article".

2. C N S Santos & G Stephanopoulos, "Combinatorial engineering of microbes for optimizing cellular phenotype", Current Opinion in Chemical Biology, Vol. 12, pp. 168 – 176, 2008.

3. Diwakar Shukla, Chetan Shinde & B L Trout, "Molecular Computations of Preferential Interaction Coefficient of Proteins", J. Phys. Chem. B, In Press.

4. Haghgooie R & Doyle P S, "Directed self-assembly of field-responsive fluids in confined geometries", Soft Matter, Submitted 8-08.

5. Harve K S, Lareu R R, Rajagopalan R & Raghunath M, "Bio-mimicry of the crowded interior of cells for enhanced nucleic acid hybridization", Cell, In preparation.

6. Harve K S, Vigneshwar R, Rajagopalan R & Raghunath M, "Macromolecular crowding as means of emulating cellular interiors in vitro: when less might be more", PNAS, USA, Vol. 105, Issue 51, pp. E119, 12-08.

7. Hwang D K, Dendukuri D & Doyle P S, "Microfluidic-based synthesis of non-spherical magnetic hydrogel particles", Lab Chip, Submitted 8-08.

8. Hwang D K, Oakey J, Toner M, Arthur J, Anseth K, Lee S, Zeiger A, Van Vliet K & Doyle P S, "Stop-Flow Lithography for the Production of Shape-Evolving Degradable Microgel Particles", J. Am. Chem. Soc., Submitted 2-09.

9. Jie Chen & B L Trout, "Computational study of the solvent effects on the molecular self-assembly of tetrolic acid in solution and consequent polymorph formed from crystallization", J. Phys. Chem. B, Submitted 06-08.

10. Panda P, Yuet K P Hatton T A & Doyle P S, "Tuning Curvature in Flow Lithography: A New Class of Concave/Convex Particles", Langmuir, Submitted 2-09.

11. S Duraiswamy & S A Khan, "Droplet based microfluidic synthesis of anisotropic metal nanocrystals", Small, submitted.

12. T Isojima, M Lattuada, J Vander Sande & T A Hatton, "Reversible clustering of pH- and temperature-responsive Janus magnetic nanoparticles", ACS Nano, Vol. 2, Issue 9, pp. 1799 – 1806, 09/2008.

13. T Isojima, S-K Suh, J VanderSande & T A Hatto, "Controlled Assembly of Nanoparticle Structures: Spherical and Toroidal Superlattices and Nanoparticle-Coated Polymeric Beads", Langmuir, Published on-line, 05-09.

14. Wei Zhang, Tang Weng Lin, Zunsheng Wang & Zhi Li, "Selective Biohydroxylation with Sphingomonas sp. HXN-200 Cytochrome P450pyr Expressed in Escherichia. coli ", Applied and Environmental Microbiology, to be submitted in early of June 2009.

Conference Publications

SINGAPORE-MIT ALLIANCE
SMA-2 PUBLICATIONS

1. Daniel Wang, "Biotechnology in Fuel and Chemicals", Sustainable Green Technology, National Taiwan University, Taiwan, July 2008.

2. Daniel Wang, "Biotechnology in Biotherapeutics Production", Recent Advances in Biotherapeutics, Mumbai, India, October 2008.

3. Diwakar Shukla & B L Trout, "Preferential Interaction Parameters of Proteins in Mixed Solvents", AICHE Annual Meeting, Philadelphia, USA, 11-08.

4. F Chen, K A Smith & T A Hatton, "Dynamics of Magnetic Nano/micro Particles on Magnetizable Surface in Centrifugal Force Field", 21th Annual Conference and Exhibition, American Filtration and Separation Society, Valley Forge PA.

5. F Chen, K A Smith & T A Hatton, "Magnetically Enhanced Centrifugation for Continuous Biopharmaceutical Processing", AIChE Annual Meeting, Philadelphia PA, 11-08.

6. Greg Stephanopoulous, "Engineering the isoprenoid pathway for the production of pharmaceuticals", The Chemical & Pharmaceutical Engineering Programme workshop, 21 Jan 2009.

7. H Zhang, L Bromberg & TA Hatton, "Catalytic magnetic nanoparticles for environmental remediation", Chemical and Biological Defense Physical Science and Technology Conference, New Orleans LA, 11-08   .

8. Harve K S, Lareu R R, Rajagopalan R & Raghunath M, "Dramatic enhancement of duplex-DNA stability in thermally stressed environments by macromolecular crowding", Joint 5th Structural Biology and Functional Genomics and 1st Biological Physics International Conference, Singapore, 12-2008.

9. Jie Chen & B L Trout, "Solution and Implications for the Polymorph Formed From Crystallization?", AICHE Annual Meeting, Philadelphia, USA, 11-08.

10. L Chen, H Zhang, L Bromberg, K A Smith, G C Rutledge & T A Hatton, "Functionalized magnetic nanoparticles and nanofibers for protection against chemical and biological toxicants", ACS Fall National Meeting, Philadelphia, PA, 08-08.

11. L Chen, L Bromberg, H Schreuder-Gibson, J Walker, Stote G C Rutledge, T A Hatton, "Electrospun Nanofibers as Reactive and Bactericidal Materials", RAHM '08, Edinburgh, Scotland, 08-08; Chemical and Biological Defense Physical Science and Technology Conference, New Orleans LA, 11-08.

12. Li Jianguo, Raj Rajagopalan, Jiang Jianwen & Mark Sayes, "Effects of molecular shapes on liquid-liquid phase behavior of a non-globular protein", International Conference on Materials for Advanced Technologies, Singapore, 07-07.

13. Lihan Zhou, Qing-En Lim, Guoqiang Wan & Heng-Phon Too, "Ribosomal Protein Genes allow Accurate Normalization of Gene Expression during Neuronal Differentiation of PC12 Cells", Joint 5th Structural Biology and Functional Genomics and 1st Biological Physics International Conference, 9-11 December 2008

14. P Panda, T A Hatton & P S Doyle, "Microfluidics Based Lithography for Fabricating Ceramic and Cell-Laden Microparticles", micro-TAS Conference, San Diego CA, 10-08; SMA Symposium, 1-09.

15. P Panda, T A Hatton & P S Doyle, "Stop-Flow Lithography: A Novel Platform for Complex Particle Synthesis", Practice School Poster Session, Won First Prize in Poster Contest, 10-08.

16. R Haghgooie, M Toner & P S Doyle, "Microfluidic Synthesis of Non-Spherical Polymeric Colloids with Tunable Deformability", AIChE Annual Conference, 1-08.

17. S A Khan & S Duraiswamy, "Tunable synthesis of metallic nanoparticles in microfluidic segmented flows", Spring Meeting of the Materials Research Society (MRS), 04-09.

18. S A Khan & S Duraiswamy, "Microfluidics with compound bubble drops", Annual Meeting: American Phyical Society (Division of Fluid Dynamics), 11-08.

19. S Sun, K Wang, D Rajarathnam, T S Chung & T A Hatton, "Fabrication of polyamide-imide nanofiltration hollow fiber membranes for glutathione separation", SMA symposium, 01-09.

20. S Tejwani, K A Smith & T A Hatton, "Separations Using Magnetic Fluids: Thermodynamics of Nonmagnetic Particles, Separations in Chemical, Environmental and Biological systems", AIChE Annual Meeting, Philadelphia PA, 11-08.

21. S Tejwani, K A Smith & TA Hatton, "Brownian Dynamics Simulations to Determine Anisotropy in Diffusion Constants of Nonmagnetic Particle in Magnetic Fluids", AIChE Annual Meeting, Philadelphia PA, 11-08.

22. Sivashangari Gnanasambandam & Raj Rajagopalan, "Growth Morphology of Alpha Glycine Crystals in Aqueous Solutions: A Computational Study", International Conference on Materials for Advanced Technologies, Singapore, 06/09.

23. Sivashangari Gnanasambandam & Raj Rajagopalan, "Effect of Solvent on the Morphology of Pharmaceutical Crystals: An Interface Structure Analysis", The International Society for Pharmaceutical Engineering (ISPE), Singapore (Regional student poster competition), 06/09.

24. T Harada & T A Hatton, "Formation of anisotropic highly ordered nanoparticle superlattices by the cooperative self-assembly of nanoparticles and amphiphilic molecules at theair-water interface", 236th ACS National Meeting, Philadelphia, PA, 08-08.

25. T S Chung, "NUS Membrane Research and Its Recent Progress on Protein and Chiral Separation", SMA CPE workshop, 05-08.

26. T S Chung, "Forward Osmosis Membranes for Water Reuse and Desalination", SMA CPE workshop, 05-09.

27. Wan Guoqiang & HPToo, "Stem-loop mediated reverse transcription quantitative PCR (SMRT-qPCR) assay fro specific quantification of mature microRNA" Joint 5th Structural Biology and Functional Genomics and 1st Biological Physics International Conference, 9-11 December 2008.

28. Wen Wang & Zhi Li, "Immobilization of Chloroperoxidase on Iron Oxide Magnetic Nanoparticles", ChemBio tech'08, Dec 2008.

29. Z Zhou, Y Xiao, T S Chung & T A Hatton, "Investigation of spacer arm length on enantiomer resolution using surface immobilized membranes", SMA symposium, 01-09.

(2) IUP: Mechanistic Understanding of Crystallization of Model Compounds for the Pharmaceutical Industry

Journal Publications

1. Gnanasambandam S, Hu Z, Jiang J & Rajagopalan R, "Force Field for Molecular Dynamics Studies of Glycine/Water Mixtures in Crystal/Solution Environments", J Phys Chem B, Vol. 113, pp 752, 2009.

2. Li J, Rajagopalan R & Jiang J, "Polymer-Induced Phase Separation and Crystallization in IgG Solutions", J. Chem. Phys., Vol.128, pp. 205105, 05-2008, (This paper was also selected into Virtual Journal of Biological physics research, 2008, 15)

3. Li J, Rajagopalan R & Jiang J, "Role of Solvent in Protein Phase Behavior: Influence of Temperature-Dependent Potential", J. Chem. Phys., Vol.128, pp. 235104, 06-08 (This paper was also selected into Virtual Journal of Biological physics research, 2008, 16)

Conference Publications

1. Gnanasambandam S, Hu Z, Jiang J & Rajagopalan R, "Selection of Force Field for Pharmaceutical Crystal Growth Studies" The International Society for Pharmaceutical Engineering (ISPE) - Won second prize in student poster competition, Singapore 2008, 06-2008.

2. Jianguo Li, Raj Rajagopalan, Jianwen Jiang & Mark Saeys, "Calculation of the phase diagrams of IgG using a simple four-site model", The 4th Graduate Student Symposium (Jointly organized by ChBE and GPBE), NUS, Singapore 2007.

Book Chapters

Li J, Rajagopalan R & Jiang J, "Molecular Modeling and Simulation for Phase Behavior of Protein Solutions", Thermodynamics of Amino Acid and Protein Solutions, Research Signpost/Transworld Science Network, 2009.

(3) IUP: High Through-Put Sensing of Biological and Chemical Systems

Journal Publications

S A Khan & S Duraiswamy, "Microfluidic emulsions with dynamic compound drops", Lab on a Chip, submitted 2009.

Conference Publications

1. Daniel I C Wang, "Recent Developments in Biotechnology", International Conference on Recent Advances in Biotherapeutics, February 2009.

2. Daniel I C Wang, "Fuels and Chemicals from Renewable Resources", The First Sustainable Green Technology Symposium, June 2008.

3. Daniel I C Wang, "Biotechnology of Mammalian Cells", 13th International Biotechnology Symposium, October 2008.