# SINGAPORE-MIT ALLIANCE
# SMA-2 PUBLICATIONS

## AMM&NS programme (AY 2007/2008)

### Number of Research Projects with publications: 1 FRP and 6 IUPs

### (A) Collaborative Publications with SMA-MIT Fellows

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

### AY 2007/2008

***Journal Publication***

1. *K L Lew, S F Yoon, W K Loke, H Tanoto, C L Dohrman, D M Isaacson & E A Fitzgerald, "High gain AlGaAs/GaAs heterojunction bipolar transistor fabricated on SiGe/Si substrate", Journal of Vacuum Science and Technology B: Microelectronic, Vol. 25, No. 3, pp. 902-905, 17 May 2007.

2. *J F Falth, S F Yoon, K H Tan & E A Fitzgerald, "The effect of nitrogen pressure during MBE growth of InAsN quantum dots", Nanotechnology, Vol. 19, pp. 045608-1 to 045608-6, 4 January 2008.

3. *K L Lew, S F Yoon, H Tanoto, K P Chen, C L Dohrman, D M Isaacson & E A Fitzgerald, "InGaP/GaAs heterojunction bipolar transistor grown on Si substrate with SiGe graded buffer layer", IEE Electronics Letters, Vol. 44, Issue 3, pp. 243-244, 31 January 2008.

4. Hong Li, Qing Zhang & Nicola Marzari, "Unique carbon-nanotube field-effect transistors with asymmetric source and drain contacts", Nano Letters, Vol. 8, Issue 1, pp. 64 – 68, January 2008.

5. Hong Li, Qing Zhang & Nicola Marzari, "Global and local charge trapping in carbon nanotube field-effect transistors", Nanotechnology, Vol. 19, pp. 175203, 25 March 2008.

6. Gao L, Yan Q, Wong C C & Chiang Y-M, "In-situ visualization of layer transitions during convective self-assembly in a sessile drop", Advanced Materials Research, Vol. 31, pp. 117 – 119, 20 November 2007.

7. Yan Q, Teh L K, Shao Q, Wong C C & Chiang Y-M, "Layer Transfer Approach to Opaline Hetero Photonic Crystals", Langmuir, Vol. 24, Issue 5, pp. 1796 – 1800, 4 March 2008.

8. Yip C H, Chiang Y-M & Wong C C, "Dielectric Band Edge Enhancement of Energy Conversion Efficiency in Photonic Crystal Dye-Sensitized Solar", Journal of Physical Chemistry C, Vol. 112, Issue 23, pp. 8735 – 8740, 12 June 2008.

9. *W K Choi, T H Liew, H G Chew, F Zheng, C V Thompson, Y Wang, M H Hong, X D Wang, L Li & J Yun, "A Combined Top-Down and Bottom-Up Approach for Precise Placement of Metal Nanoparticles on Silicon", Small, Vol. 4, Issue 3, pp. 330-333, 13 February 2008.

10. H P Yu, K L Pey, W K Choi, M K Dawood, H G Chew, D A Antoniadis, E A Fitzgerald & D Z Chi, "The effect of an yttrium interlayer on a ni germanided metal gate workfunction in SiO2/HfO2", IEEE Electron Device Letters, Vol. 28, Issue 12, pp. 1098 – 1101, December 2007.

11. *H Hartono, C B Soh, S J Chua & E A Fitzgerald, "High quality GaN grown from a nanoporous GaN template", Journal of the Electrochemical Society, Vol. 154, Issue 12, pp. H1004-H1007, 8 October 2007.

12. *H Hartono, C B Soh, S J Chua & E A Fitzgerald, "Fabrication and characterization of nano-porous GaN template for strain relaxed GaN growth", Physica Status Solidi (b), Vol. 244, No. 6, pp. 1793-1796, 9 May 2007.

13. *H Hartono, C B Soh, S Y Chow, S J Chua & E A Fitzgerald, "Reduction of threading dislocation density in GaN grown on strain relaxed nanoporous GaN template", Applied Physics Letters, Vol. 90, Issue 17, pp. 171917, 25 April 2007.

***Conference Publication***

1. *H Tanoto, S F Yoon, C Dohrman, E A Fitzgerald & B Narayanan, "InAs quantum dots grown on vicinal SiGe/Si substrate", European-Materials Research Society (E-MRS) Spring Meeting, Strasbourg, France, 28 May – 1 June 2007.

2. *K P Chen, S F Yoon, K L Lew, T K Ng, C L Dohrman & E A Fitzgerald, "Improved electrical characteristics of gallium arsenide p-n homojunction diode grown on silicon-germanium virtual substrate", Singapore-MIT Alliance (SMA) Annual Symposium 2008 & 5th International Symposium on Nanomanufacturing (ISNM-5), Singapore, 23 – 25 January 2008.

3. Osama Nayfeh, D A Antoniadis, S Boles, C Thompson & E A Fitzgerald, "Selective Attachment of Au nanoparticles on short SOI sidewalls for the Selective Growth of Bridging Silicon Nanowires", Materials Research Symposium (MRS), In preparation.

4. Wang Xiaodong, K L Pey, Charles Ho, W K Choi, E A Fitzgerald & D A Antoniadis, "Au film catalyzed Si/SiGe nanowire formation", Electromchemical Society Meeting, In preparation.

5. Yan Q, Wong C C & Chiang Y-M, "Template growth of large-area nanostructured arrays by using highly ordered anodic aluminum oxide membrane", 5th International Symposium on Nanomanufacturing, January 2008.

6. Yan Q, Wong C C & Chiang Y-M, "Layer transfer approach to engineering colloidal photonic crystals", Materials Research Society Fall Meeting, November 2007.

7. Yan Q, Nukala P, Chiang Y-M & Wong C C, "Three-dimensional metallic photonic crystals fabricated by double templating", The 4th International Conference on Technological Advances of Thin Films & Surface Coatings (Thin Films 2008), Accepted.

8. C H Yip, Y M Chiang & C C Wong, "Large-area TiO2 Inverse Opal Through Colloidal Self-Assembly And Sol-gel Infiltration", 5th International Symposium on Nano-manufacturing, January 2008.

9. V Sharma, Q Yan, C C Wong, W C Carter & Y M Chiang, "Directed Assembly of Charged Colloidal Particles", 5th International Symposium on Nano-manufacturing, January 2008.

10. V Sharma, Q Yan, C C Wong, W C Carter & Y M Chiang, "Controlled Rapid Ordering of Oppositely Charged Colloidal Particles", Materials Research Society Fall Meeting, Boston, MA, USA, November 2007.

11. C H Yip, Y M Chiang & C C Wong, "Dielectric Band Edge Enhancement of Energy Conversion Efficiency in Photonic Crystal Dye-Sensitized Solar", Materials Research Society Spring Meeting, San Francisco, USA, March 2008.

**(2) IUP: Lattice-Mismatched Materials**

***Journal Publication***

1. *K L Lew, S F Yoon, W K Loke, H Tanoto, C L Dohrman, D M Isaacson & E A Fitzgerald, "High gain AlGaAs/GaAs heterojunction bipolar transistor fabricated on SiGe/Si substrate", Journal of Vacuum Science and Technology B: Microelectronic, Vol. 25, No. 3, pp. 902-905, 17 May 2007.

2. *J F Falth, S F Yoon, K H Tan & E A Fitzgerald, "The effect of nitrogen pressure during molecular beam epitaxy growth of InAsN quantum dots", Nanotechnology, Vol. 19, pp. 045608-1 to 045608-6, 4 January 2008.

3. *K L Lew, S F Yoon, H Tanoto, K P Chen, C L Dohrman, D M Isaacson & E A Fitzgerald, "InGaP/GaAs heterojunction bipolar transistor grown on Si substrate with SiGe graded buffer layer", IEEE Electronics Letters, Vol. 44, Issue 3, pp. 243-244, 31 January 2008.

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, Issue 10, pp. 104901-1 to 104901-6, 16 May 2008.

5. 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, (submitted).

6. H Tanoto, S F Yoon, C Y Ngo, W K Loke, C Dohrman, E A Fitzgerald & B Narayanan, "Structural and optical properties of stacked self-assembled InAs/InGaAs quantum dots on graded $Si_{1-x}Ge_x$/Si substrate", Applied Physics Letters, Vol. 92, Issue 21, pp. 213115, 30 May 2008.

7. *H Hartono, C B Soh, S Y Chow, S J Chua & E A Fitzgerald, "Reduction of threading dislocation density in GaN grown on strain relaxed nanoporous GaN template", Applied Physics Letter, Vol. 90, Issue 17, pp. 171917, 25 April 2007.

8. *H Hartono, C B Soh, S J Chua & E A Fitzgerald, "High quality GaN grown from a nano-porous GaN template", Journal of The Electrochemical Society, Vol. 154, Issue 12, pp. H1004-H1007, 8 October 2007.

9. *H Hartono, C B Soh, S J Chua & E A Fitzgerald, "Fabrication and characterization of nano-porous GaN template for strain relaxed GaN growth", Physica Status Solidi (b), Vol. 244, No. 6, pp. 1793-1796, 9 May 2007.

***Conference Publication***

1. *H Tanoto, S F Yoon, C Dohrman, E A Fitzgerald & B Narayanan, "InAs Quantum Dots Growth on Vicinal SiGe/Si Substrate", European-Materials Research Society (E-MRS) Spring Meeting, Strasbourg, France, 28 May – 1 Jun 2007.

2. *K P Chen, S F Yoon, K L Lew, T K Ng, C L Dohrman & E A Fitzgerald, "Improved electrical characteristics of gallium arsenide p+-n-n+ homojunction diode grown on silicon-germanium virtual substrate", Singapore-MIT Alliance (SMA) Annual Symposium 2008 & 5th International Symposium on Nanomanufacturing (ISNM-5), Singapore, 23 – 25 January 2008.

3. H Hartono, C B Soh, S J Chua & E A Fitzgerald, "Fabrication and characterization of nano-porous GaN template for strain relaxed GaN growth", International Workshop on Nitride Semiconductors (IWN), Kyoto, Japan, 22 – 27 October 2006.

**(3) IUP: Integrated MRAM**

***Journal Publication***

1. X S Gao, A O Adeyeye & C A Ross, "Magnetization Reversal Process in Elongated Co Rings with Engineered Defects", Journal of Applied Physics, Vol. 103, Issue 6, Art No. 063906, 18 March 2008.

2. A O Adeyeye, S Goolaup, N Singh, C C Wang, X S Gao, C A Ross, W Jung & F J Castano, "Magnetostatic Coupling in arrays of elongated Ni80Fe20 rings", Journal of Physics D: Applied Physics, Vol. 40, No. 21, pp. 6479 – 6483, 19 October 2007.

3. X S Gao, A O Adeyeye, S Goolaup, N Singh, W Jung, F J Castano & C A Ross, "Inhomogeneities in spin states and magnetization reversal of geometrically identical elongated Co rings", Journal of Applied Physics, Vol. 101, Issue 9, 09F505, 10 April 2007.

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

***Conference Publication***

G Y H Lee, K S W Tan, S Suresh & C T Lim, "In vitro study of blood flow disruption in malaria", Singapore-MIT Alliance (SMA) Annual Symposium 2007, Singapore, 23 – 24 January 2007.

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

***Journal Publication***

*W K Choi, T H Liew, H G Chew, F Zheng, C V Thompson, Y Wang, M H Hong, X D Wang, L Li & J Yun, "A combined top-down and bottom-up approach for precise placement of metal nanoparticles on silicon", Small, Vol. 4, Issue 3, pp. 330 – 333, 13 February 2008.

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

***Journal Publication***

H L Leong, C L Gan, C V Thompson, K L Pey & H Y Li, "Application of contact theory to metal-metal bonding of silicon wafers", Journal of Applied Physics, Vol. 102, Issue 10, Art. No. 103510, 27 November 2007.

***Conference Publication***

1. C V Thompson, R Tadepalli, K T Turner & C L Gan, "Bonded Interconnects for Three-Dimensional Integrated Circuits", Materials Research Society (MRS) Fall Meeting 2007, Boston, USA, 27 – 29 November 2007 (invited).

2. C L Gan, H L Leong, C V Thompson, K L Pey & H Y Li, "Effects of Nanometer-Scale Surface Roughness and Applied Load on the Bond Strength and Contact Resistance of Cu-Cu Bonded 3D ICs", Materials Research Society (MRS) Fall Meeting 2007, Boston, USA, 27 – 29 November 2007.

# SINGAPORE-MIT ALLIANCE
# SMA-2 PUBLICATIONS

## AMM&NS programme (AY 2007/2008)

### (B) Non-collaborative Publications

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

### AY 2007/2008

***Journal Publication***

1. Osama Nayfeh, C Ni Chleirigh, J L Hoyt & D A Antoniadis, "Measurement of Enhanced Gate-Controlled Band-To-Band Tunneling in Highly Strained Silicon-Germanium Diodes", IEEE Electron Device Letters, Vol. 29, Issue 5, pp. 468 – 470, 22 April 2008.

2. O'Reilly, Thomas B & Henry I. Smith, "Photoresist characterization using double exposures with interference lithography", Journal of Vacuum Science and Technology B: Microelectronics & Nanometer Structures, Vol. 26, Issue 1, pp. 128, 4 January 2008.

3. J Oh & C V Thompson, "Selective Barrier Perforation in Porous Alumina Anodized on Substrates", Advanced Materials, Vol. 20, Issue 7, pp. 1368 – 1372, 2008.

4. O Uzun, Y Hu, A Verma, S Chen, A Centrone & F Stellacci, "Water-soluble amphiphilic gold nanoparticles with structured ligand shells", Journal of the Chemical Society, Chemical Communications, Vol. 2, pp. 196, 2008.

5. B Long, T M Wu & F Stellacci, "Ultra-fast and Scalable sidewall Functionalisation of Single-Walled Carbon Nanotubes with Carboxylic Acid", Journal of the Chemical Society, Chemical Communications, Issue 24, pp. 2788 – 2790, published on line, DOI: 10.1039/b719380g, 16 April 2008.

6. J Yuan, X Liu, O Akbulut, J Hu, s L Suib, J Kong & F Stellacci, "Superwetting Nanowire Membranes for Selective Absorption", Nature Nanotechnology, Vol. 3, Issue 3, pp. 332 – 336, 30 May 2008.

7. A Centrone, E Penzo, M Sharma, J Myerson, A M Jackson, N Marzari & F Stellacci, "The role of nanostructure in the wetting behavior of mixed-monolayer-protected metal nanoparticles", Proceeding of the National Academy of Science, Vol. 105, No. 29, pp. 9886 – 9891, 22 July 2008.

8. F Zheng, W K Choi, F Lin, S Tripathy & J X Zhang, "Stress Tuning of Ge Nanocrystals Embedded in Dielectrics", Journal of Physical Chemistry C, Vol. 112, Issue 25, pp. 9223 – 9228, 29 May 2008.

9. Y S Jung & C A Ross, "Orientation-controlled Self-Assembly Polystyrene-Polydimethylsiloxane Block Copolymer", Nano Letters, Vol. 6, pp. 2332, 2007.

10. C A Ross, "Self-Assembled Resists for Nanolithography", Microlithography World, Vol. 16, Issue 2, pp. 4, 1 May 2007.

***Conference Publication***

1. Osama Nayfeh, D A Antoniadis, K Mantey & M H Nayfeh, "Memory effects in metal-oxide semiconductor capacitors incorporating dispensed highly monodisperse 1 nm Si nanoparticles", Device Research Conference (DRC), June 2007.

2. Nicola Marzari, "Characterizing nano- and bio-materials from first-principles", National Security Administration Workshop on Bioinstrumentation, Washington DC, February 2007.

3. Nicola Marzari, "Towards multifunctional biosensors based on carbon-nanotube arrays", National Security Administration Workshop on Bioinstrumentation, Washington DC, February 2007.

4. Nicola Marzari, "Engineering carbon nanotubes form first-principles", Colloquium, Dept. of Chemistry, Georgetown University, Washington DC, February 2007 & Department of Physics, Addis Abeba University, Ethiopia, March 2008.

5. Nicola Marzari, “Nanomaterials”, Innovation Scientific Fair, Udine, Italy, February 2007.

6. Nicola Marzari, “Making mountains out of molehills, and other tails of disentanglement”, CECAM Workshop on “Maximally-localized Wannier functions”, Ecole Normale Superieure, Lyon (France), June 2007.

7. Nicola Marzari, “An ab-initio approach to the teaching of materials science curricula”, NINE Engineering Workshop, Sandia National Lab, Albuquerque NM, June 2007.

8. A Mostofi & Nicola Marzari, “Maximally-Localised Wannier Functions as Building Blocks for Large-Scale Electronic Structure Calculations”, CECAM Workshop on “Linear scaling ab-initio calculations: applications and future directions”, Ecole Normale Superieure, Lyon (France), September 2007 & 12$^{th}$ Nanoquanta Workshop on Electronic Excitations, Paul Langevin Centre, Assois, France, September 2007.

9. Nicola Marzari, “Electronic-structure modeling of multifunctional materials”, Army Research Lab, Aberdeen MD, September 2007.

10. Nicola Marzari, “Realistic electronic-structure modeling of nanostructures”, ICTP African College on Science at the Nanoscale, Themba Labs, Stellenbosch (South Africa), November 2007.

11. Nicola Marzari, “Mechanics and dynamics at the nanoscale”, ICTP African College on Science at the Nanoscale, Themba Labs, Stellenbosch (South Africa), November 2007.

12. N Bonini & Nicola Marzari, “Phonon-phonon interactions in carbon nanotubes, grapheme and graphite”, MRS Fall Meeting, Boston MA, November 2007.

13. Nicola Marzari & Zhang Qing, “Carbon nanotube field-effect transistors: an experimental and theoretical investigation of I-V characteristics and Schottky barriers“, SMA-2 AMM&NS Symposium, NUS, Singapore, January 2008.

14. Nicola Marzari, “Towards first-principles electrochemistry: electron-transfer reactions and electrochemical potentials in fuel cells”, SIMBIOMA Conference on Molecular Simulations in Biosystems and Materials Science, University of Konstanz, Germany, April 2008.

15. Nicola Marzari, “Thermal management and ballistic breakdown in carbon nanostructures”, ICTP/NSF School on Electronic-structure Methods, African Institute of Mathematical Sciences, Cape Town, South Africa, July 2008.

16. N E Singh-Miller & Nicola Marzari, “Work function of functionalized single-wall carbon nanotubes”, APS March Meeting, Denver, March 2007.

17. N E Singh-Miller & Nicola Marzari, “Schottky Barrier Heights in CNT-Metal Junctions from First-principles”, APS March Meeting, New Orleans, March 2008.

18. N Bonini & Nicola Marzari, “Anharmonic phonon lifetimes in grapheme, graphite and carbon nanotubes”, APS March Meeting, New Orleans, March 2008.

19. T B O’Reilly & H I Smith, “Linewidth uniformity in Lloyd’s mirror interference lithography systems”, International Conference on Electron, Ion and Photon Beam Technology and Nanofabrication, May 2008.

20. F Stellacci, “Supramolecular Nanoscale Materials”, Department of Materials Science and Engineering, University of Washington, Seattle, WA, January 2007 & University of Aarhus, Aarhus Denmark, January 2007.

21. F Stellacci, “From Nanoparticles to Nanopolymers”, ACS National Meeting, Chicago, IL, March 2007.

22. F Stellacci, "Supramolecular Nanomaterials", Department of Materials Science and Engineering, University of Erlangen, Erlangen, Germany, April 2007 & Max-Planck-Institut fur Festkorperforschung, Stuttgart, Germany, April 2007.

23. F Stellacci, "Supramolecular NanoStamping", Optics East, SPIE Regional Meeting, Boston, MA, September 2007 & International Nanotechnology Conference, Boston, MA, November 2007.

24. F Stellacci, "Nanoparticles and Cells", Association of Official Analytical Chemists-International Meeting, Anaheim, CA, September 2007.

25. F Stellacci, "Supramolecular Materials", Department of Physics, Universita' di Trento, Trento, Italy, December 2007.

26. F Stellacci, "Supramolecular Materials and Lithography", Department of Chemical Engineering, Korean Advanced Institute of Science and Technology, Daejon, South Korea, December 2007.

27. E A Fitzgerald, "Roles for SiGe and III-V Integration in Si CMOS Systems", KTH, Stockholm, Sweden, October 2007.

**(2) IUP: Lattice-Mismatched Materials**

***Conference Publication***

1. S F Yoon, "III-V/Si integration: New materials, devices and markets", at the Joint Singapore-Sheffield Seminar on III-V Technology held in IMRE on 5 Oct 2007.

2. S F Yoon, "Engineering semiconductors for semiconductor engineering: III-V/Si integration", at the launch of the NTU Institute for Sustainable Nanoelectronics on 29 Oct 2007, where the plenary and keynote speakers were Prof Michael Rabin (Harvard University) and Prof Jim Meindl (Georgia Tech).

3. S J Chua, "Nanostructures for Optoelectronics", Keynote Speaker, 1st International Workshop on Nanotechnology and Applications, Vung Tau City, Vietnam, 15 – 17 November 2007.

4. S J Chua, "Nanostructures for Optoelectronic Device Applications", 4th International Workshop on Nanoscale Semiconductor Devices, Ramada Plaza Hotel, Jeju, South Korea, 4 – 6 April 2007.

**(3) IUP: Exploratory Research on Phase Change Materials for Applications in Micro- and Nano-Systems**

***Journal Publication***

Y Li, "Phase change materials in optically triggered microactuators", Submitted to The Journal Microelectromechanical Systems in Nov 2007.

***Conference Publication***

1. Y Li, "Application of phase change materials in Micro-Nano-Systems", Singapore-MIT Alliance (SMA) Annual Symposium 2007, Singapore, 23 – 24 January 2007.

2. Y Li, "Exploratory research on phase change materials for the application in Micro-Nano-Systems", Singapore-MIT Alliance (SMA) Annual Symposium 2008, 23 – 25 January 2008.

**(4) IUP: Integrated MRAM**

***Journal Publication***

1. F Y Ogrin, E Sirotkin, G Van Der Laan, G Beutire, C A Ross, W Jung & R Menon, "Soft x-ray resonant magnetic scattering investigation of stable magnetic configurations in patterned rings", Journal Applied Physics, Vol. 103, Issue 7, pp. 07E909, 6 February 2008.

2. S Tacchi, M Madami, G Gubbiotti, G Carlotti, W Jung, C A Ross, "Spin waves in exchange-biased NiFe/IrMn circular nanorings", Journal Applied Physics, Vol. 103, Issue 7, pp. 07C103, 28 January 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 (submitted).

4. W Jung, F J Castano & C A Ross, "Current-in-plane magnetoresistance of spin valve elliptical rings", Applied Physical Letters, Vol. 91, Issue 15, pp. 152508, 12 October 2007.

5. J Llandro, T J Hayward, D Morecroft, J A C Bland, F J Castano, I A Colin & C A Ross, "Quantitative digital detection of magnetic beads using pseudo-spin-valve rings for multiplexed bioassays", Applied Physics Letters, Vol. 91, Issue 20, pp. 203904, 15 November 2007.

6. F Y Ogrin, S M Weekes, B Cubitt, A Wildes, A Drew, C A Ross, W Jung, R Menon & B Toperverg, "Polarized neutron reflectivity investigation of periodic magnetic rings", IEEE Transactions on Magnetics, Vol. 43, No. 6, pp. 2731-3, June 2007.

***Conference Publication***

1. C A Ross, "Magnetic nanostructures", German Physical Society Workshop, Bad Honnef, Germany & NUS Physics Department, Singapore, January 2006.

2. C A Ross, "Magnetic properties of lithographic nanostructures", IBM, T J Watson Research Center, February 2006.

3. C A Ross, "Magnetic Multilayer Rings", Materials Research Society Spring Meeting, San Francisco, CA, April 2006.

4. C A Ross, "Magnetic ring devices", SRC workshop, University of Albany, September 2006.

5. C A Ross, "Magnetic properties of Nanoparticle Arrays", NIST, Gaithersburg MD, September 2006.

6. C A Ross, "Giant magnetoresistance in multilayered magnetic rings", 13$^{th}$ International Conference on Solid Films and Surfaces (ICSFS), Bariloche, Argentina, November 2006.

7. C A Ross, "Magnetism in multilayer thin film rings", Yale University, CT, March 2007 & Condensed Matter and Materials Physics Conference, Leicester, UK, Wohlfarth Lecture (UK Magnetics Society Lecture), April 2007.

8. C A Ross, "Magnetic rings for memory and logic", USC and UCLA, March 2008.

9. C A Ross, "Magnetism and magnetoresistance in multilayer thin film rings", plenary talk, JEMS, Dublin, September 2008 & AVS, Boston, October 2008.

10. A O Adeyeye, "Magnetic Nanostructures for Spintronic Applications", 2$^{nd}$ MRS-S Conference on Advance Materials, Singapore, January 2006 & TMS 2006, San Antonio Texas, TX, March 2006.

11. A O Adeyeye, "Properties of Magnetic Nanostructures", Presented at 6$^{th}$ IEEE Metallic Mutilayers (MML 2007), Perth, Australia, 15 – 19 October 2007.

12. A O Adeyeye, "Patterned Ferromagnetic Nanostructured Arrays", IUMRS-ICEM-08, Sydney, Australia, 28$^{th}$ July to 1$^{st}$ August 2008.

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

# SINGAPORE-MIT ALLIANCE
# SMA-2 PUBLICATIONS

***Journal Publication***

1. G Y H Lee & C T Lim, "Nanotechnology and human diseases", COSMOS, Vol. 3, Issue 1, pp. 89 – 101, November 2007.

2. A Li, P Y Lee, B Ho, L J Ding & C T Lim, "Atomic force microscopy study of the antimicrobial action of Sushi peptides on Gram negative bacteria", Biochimica et Biophysica Acta – Biomembranes, Vol. 1768, Issue 3, pp. 411 – 418, March 2007.

***Conference Publication***

1. Q S Li, G Y H Lee, C N Ong & C T Lim, "Indentation study of breast cancer cells using atomic force microscopy", 3rd MRS-S Conference on Advanced Material, Singapore (2008).

2. Q S Li, B P Ting, G Y H Lee, C N Ong & C T Lim, "Micropipette aspiration of breast cancer cells", 3rd Tohoku-NUS Joint Symposium on Nano-Biomedical Engineering in the East Asian-Pacific Rim Region, Singapore (2007).

3. G Y H Lee & C T Lim, "Single cell mechanics: Role in studying human diseases", 3rd Asian-Pacific Congress on Computational Mechanics and the 11th International Conference on the Enhancement and Promotion of Computational Methods in Engineering and Science, Kyoto, Japan (2007).

4. G Y H Lee, K S W Tan & C T Lim, "Nanobiomechanical studies of human diseases", International Conference on Advanced Technology in Experimental Mechanics and the 6th Asian Conference on Experimental Mechanics, Fukuoka, Japan (2007).

5. G Y H Lee & C T Lim, "Nanobiomechanics: role in human diseases and health", 1st International Symposium on the 2007 Global Centre of Excellence Programme (Global Nano-Biomedical Engineering Education and Research Network Centre), Tokyo, Japan (2007).

6. G Y H Lee, K S W Tan & C T Lim, "Simulation of malarial parasite induced disruption of blood flow in human capillaries using microfluidics", NUS Office of Life Sciences Conference, Singapore (2007).

7. G Y H Lee & C T Lim, "Microfluidic studies of malaria-infected human red blood cells", 2nd Tohoku-NUS Joint Symposium on the Future Nano-medicine and Bioengineering in the East-Asian Region, Singapore (2006).

# SINGAPORE-MIT ALLIANCE
# SMA-2 PUBLICATIONS

## CSB programme (AY 2007/2008)

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

### (A) Collaborative Publications with SMA-MIT Fellows

**(1) FRP: Tissue Systems Biology**

**AY 2007/2008**

***Conference Publications***

Wang Z Y, Gong Z Y & Matsudaira P, "Study on intestinal epithelia in zebrafish implicates restriction of epithelial stem cells in the inter-villi region", 12th Biological Sciences Graduate Congress, Kuala Lumpur, Malaysia, December 2007.

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

***Journal Publications***

A Rabodsey, Y Yao, F W Luscinscas, A K Shaw & C F Dewey Jr, "Early Response of Endothelial Cells to Flow May Be Mediated by VE-Cadherin", Cell Communication And Adhesion, Vol. 14, Issue 5, pp. 195 – 209, 1 September 2007.

***Conference Publications***

1. K Dang, K R Stiehl, S Ayyadurai, B S Seah, S S Bhowmick, C F Dewey Jr, "An Information Architecture to Support Molecular Pathway Models", In Biomedical Engineering Society Annual Fall Meeting, Los Angeles, September 2007 (Poster).

2. Y Yao, H Huang, M Cieslewicz & C F Dewey Jr, "Three-Dimensional Mapping of the Glycocalyx Layer on Endothelial Cells", Biomedical Engineering Society Annual Meeting, Los Angeles, September 2007.

3. Y Yao, M Cieslewicz, H Huang, E R Damiano & C F Dewey Jr, "Dynamics of the Endothelial Glycocalyx Layer Subjected to Unsteady Flow", Biomedical Engineering Society Annual Meeting, Los Angeles, September 2007.

4. K R Stiehl, K Dang, S Ayyadurai, S B Siew, S S Bhowmick & C F Dewey Jr, "A new approach to database creation using ontologies: OWLdb", Biomedical Engineering Society Annual Meeting, Los Angeles, September 2007.

5. S Ayyadurai, C Tan & C F Dewey Jr, "Distributed computing of complex collections of biological pathways", World Conference on Medical Physics and Biomedical Engineering, Seoul, Korea, 2006.

**(3) IUP: Advanced Microscopy for Bioinformatics**

***Journal Publications***

1. H S Kwon, S Lin, H Yu & P T C So, "Effects of Optical Clearing in Nonlinear Optical Microscopy Imaging of Cryo-Preserved Tissue Specimens", Journal Biomedical Optics, Submitted.

2. E Chung, Y H Kim, W T Tang, C J R Sheppard & P T C So, "Wide-field super-resolution Microscopy with Standing Surface Plasmon Resonance Waves", Nature Optics, Submitted.

3. W T Tang, E Chung, Y Kim, P T C So & C J R Sheppard, "Effects of using a metal layer in total internal reflection fluorescence microscopy", Applied Physics A: Materials Science & Processing, Vol. 89, No. 2, pp. 333 – 335, November 2007.

4. W T Tang, E Chung, Y H Kim, P T C So & C J R Sheppard, "Investigation of the point spread function of surface plasmon-coupled emission microscopy", Optics Express, Vol. 15, No. 8, pp. 4634 – 4646, 16 April 2007.

***Conference Publications***

1. W T Tang, E Chung, Y Kim, P T C So & C J R Sheppard, "Surface Plasmon coupled emission microscopy", SMA International Conference 2008 & 5th International Symposium on Nanomanufacturing, Singapore, 23 – 25 January 2008.

2. N K Balla, P T C So & C J R Sheppard, "gold nanoparticles – contrast agents for nonlinear microscopy", SMA International Conference 2008 & 5th International Symposium on Nanomanufacturing, Singapore, 23 – 25 January 2008.

**(4) IUP: Advanced Computational Image Analysis**

***Conference Publication***

1. A Ng, J C Rajapakse, J G Evans & R Welsch, "Statistical Analysis of Macrophage Cell Morphology after Microtuble Disruption", 12th International Conference on Research in Computational Molecular Biology (RECOMB 2008), Singapore, March 2008.

2. M Veronika, J G Evans, P Matsudaira, R E Welsch & J C Rajapakse, "Size-Specific and Brightness-Weighed Cell Tracking in 2D images", 12th International Conference on Research in Computational Molecular Biology (RECOMB 2008), Singapore, March 2008.

# SINGAPORE-MIT ALLIANCE
# SMA-2 PUBLICATIONS

## CSB programme (AY 2007/2008)

### (B) Non-collaborative publications

**(1) FRP: Tissue Systems Biology**

### AY 2007/2008

***Journal Publications***

1. Li Z, Korzh V & Gong Z Y, "Localized rbp4 expression in the yolk syncytial layer plays a role in yolk cell extension and early liver development", BMC Developmental Biology, Vol. 7, pp. 117, 19 October 2007.

2. Shen C H, Ge Q, Talay O, Eisen H N, Garcia-Sastre A & Chen J, "Loss of interleukin (IL)-7R and IL-15R expression is associated with disappearance of memory following influenza infection T cells in respiratory track", Journal of Immunology, Vol. 180, Issue 1, pp. 171-178, 2008.

3. Le Saux A, Ng P M L, Koh J Y Y, Low D H P, Leong G E L, Ho B & Ding J L, "The macromolecular assembly of pathogen recognition receptors is impelled by serine proteases, via their complement control protein (CCP) modules", Journal Molecular Biology, Vol. 377, Issue 3, pp. 902-913, 28 March 2008.

4. S Suresh, "Biomechanics and biophysics of cancer cells", Acta Biomaterialia, Vol. 3, Issue 4, pp. 413-438, July 2007.

5. S Suresh, M Puig-de-Morales-Marinkovic, K T Turner, J P Butler & J J Fredberg, "Viscoelasticity of the human red blood cell", American Journal Physiology Cell Physiology, Vol. 293, Issue 2, pp. C597-C605, August 2007.

6. S Suresh, "Nanomedicine: Elastic clues in cancer detection", Nature Nanotechnology, Vol. 2, Issue 12, pp. 748-749, 2 December 2007.

7. Du Y N, Han R B, Ng S S, Ni J, Sun W X, Wohland T, Ong S H, Kuleshova L & Yu H, "Identification and characterization of a novel pre-spheroid 3-Dimensional hepatocyte monolayer on Galactosylated Substratum", Tissue Engineering, Vol. 13, Issue 7, pp. 1455-1468, July 2007.

8. Khong Y M, Chang S, Samper V D, Tang H H & Yu H, "Novel intra-tissue perfusion system for culturing thick liver tissue", Tissue Engineering, Vol. 13, Issue 9, pp. 2345-2356, September 2007.

9. Toh Y C, Zhang J Z, Khong Y M, Du Y, Sun W & Yu H, "Integrating sensitive quantification of hepatic metabolic functions by capillary electrophoresis with laser induced fluorescence detection", The Analyst, Vol. 133, Issue 3, pp. 326, 5 February 2008.

10. Du Y N, Han R, Wen F, Ng S S, Leo H L, Wohland T & Yu H, "Synthetic Sandwich culture of 3D Hepatocyte Monolayer", Biomaterials, Vol. 29, Issue 3, pp. 290-301, January 2008.

11. Ong S M, Zhang C, Toh Y C, Kim S H, Foo H L, Tan C H, Van Noort d, Park S & Yu H, "A gel-free 3D mammalian cell perfusion-culture system in microfluidic channel", Biomaterials, Submitted, 2008.

12. Zhao D Q, Yue Z L, Ong S M, Toh Y C, Jiang Z Y, Tan C H, Chen J P & Yu H, "Dendrimer Hydrazide as Transient Inter-Cellular Linker", Biomaterials, Vol. 29, Issue 27, pp. 3673, 12 June 2008.

***Conference Publications***

1. Le M, B Lim & H Lodish, "Post-Transcriptional mechanisms modulating differentiation of stem cells", Singapore-MIT Alliance (SMA) Annual Symposium, Singapore, 23 – 24 January 2007.

2. Chia S M, Tan N, Chen C L, Chia S M, Xiao G F, Sun W X & Yu H, "Standardized quantification on liver fibrosis using second harmonic generation and two-photon microscopy", Focus on Microscopy, Cairns, Queensland Australia, 13 – 16 April 2008.

3. Tai D C S, Kuan F Y, Tan N, Venkatraman L, Bhowmick S & Yu H, "TGF-B homeostasis is important for liver fibrosis resolution", Keystone Symposium on TGF-B Family in Homeostasis and Disease, Santa Fe, New Mexico, USA, 3 – 8 February 2008.

4. Chia S M, Mao H Q & Yu H, "sustained presentation of transforming growth factor B 1 (TGF-B1) to encapsulated hepatocytes mimicking the stimulatory effects of 3D co-culture", International Conference on Advances in Bioresorbable Biomaterials for Tissue Engineering, Singapore, 5 – 6 January 2008.

5. Tai D C S, Kang C H, Chia S M, Tan N, Xiao G F & Yu H, "Quantification of liver fibrosis using second harmonic generation laser microscopy", International Conference on Advances in Bioresorbable Biomaterials for Tissue Engineering, Singapore, 5 – 6 January 2008.

6. Murrell M, "Collective Behavior in Epithelial Sheets", Complexity in Biological and Soft Matter, Los Alamos National Labs Santa Fe, New Mexico, May 2007.

7. Low Diana H P, Le Saux A, Ng P M L, Chen J Z & Ding J L, "Molecular basis of pathogen recognition receptor interactions and its role in infection", SMA Conference, International Conference on Advances in Bioresorbable Biomaterials for Tissue Engineering, Singapore, 5 – 6 January 2008.

8. Low Diana H P, Le Saux A, Ng P M L, Chen J Z & Ding J L, "Formation of pathogen recognition complex during an immune response to infection", SMA Conference, International Conference on Advances in Bioresorbable Biomaterials for Tissue Engineering, Singapore, 5 – 6 January 2008.

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

***Conference Publications***

1. S S Bhowmick, E Leonardi & H Sun, "Efficient Processing of High Selective XML Twig Patterns with Parent-Child Edges in a Tree-Unaware RDBMS", In Proceedings of the 16th ACM International Conference on Information and Knowledge Management (ACM CIKM 2007), ACM Press, Lisbon, Portugal, November 2007.

2. S Ayyadurai & C F Dewey Jr, "Scalable Methods for Large Molecular Pathway Calculations: Application to EGRF", Biomedical Engineering Society Annual Meeting, Los Angeles, September 2007.

3. S Ayyadurai, C F Dewey Jr, "Synchronous Solver for Automatically Integrating an Ensemble of Biochemical Network Models", Biomedical Engineering Society Annual Meeting, Los Angeles, September 2007.

4. S Ayyadurai, P W Hunter, P Villiger, J Butterworth, J Bassingthwaighte & C F Dewey Jr, "Normalization of biological pathways", World Conference on Medical Physics and Biomedical Engineering, Seoul, Korea, 2006.

5. S S Bhowmick & S Prakash, "Every Click You Make, I Will be Fetching It: Efficient XML Query Processing in RDBMS Using GUI-driven Prefetching", In Proceeding of the 22nd IEEE International Conference on Data Engineering (ICDE 2006), IEEE Computer Society, Atlanta, USA, April 2006.

6. S S Bhowmick, "Towards Da Vinci's Notebook: Empowering Scientists to Explore Data", Invited Talk, Kyoto University, Japan, June 2007.

**(3) IUP: Advanced Microscopy for Bioinformatics**

***Journal Publications***

# SINGAPORE-MIT ALLIANCE
# SMA-2 PUBLICATIONS

1. D M W-Brown, H S Kwon, Y S Nam, P T C So & B P Engelward, "Novel Imaging Platform Reveals Clonal Expansion as a Major Driver of Mutation Load in the Pancreas", Proceedings National Academy Sciences, USA, submitted.

2. K Bahlmann, P T C So, M Kirber, R Reich, B Kosicki, W McGonagle & K Bellve, "Multifocal multiphoton microscopy (MMM) at a frame rate beyond 600 Hz", Optics Express, Vol. 15, Issue 17, pp. 10991-10998, 20 August 2007.

3. E Chung, D Kim, Y Cui, Y H Kim & P T C So, "2D standing wave total internal reflection fluorescence microscopy: super-resolution imaging of single molecular and biological specimens", Journal of Biophysical, Vol. 93, Issue 5, pp. 1747 – 1757, 1 September 2007.

4. K H Kim, C Buehler, K Bahlmann, T Ragan, W C A Lee, E Nedivi, E L Heffer, S Fantini & P T C So, "Multifocal multiphoton microscopy based on multianode photomultiplier tubes", Optics Express, Vol. 15, Issue 18, pp. 11658-11678, 3 September 2007.

5. T Ragan, J D Sylvan, K H Kim, H Huang, K Bahlmann, R T Lee & P T C So, "High-resolution whole organ imaging using two-photon tissue cytometry", Journal of Biomedical Optics, Vol. 12, Issue 1, pp. 01415, 5 February 2007.

***Conference Publications***

1. P T C So, "Global Analysis in FLIM-FRET Microscopy", FLIM Workshop, Berkeley, CA, 19 January 2007 & University of Virginia, Keck Imaging Center, Workshop on FRET Microscopy, Charlottsville, VA, 9 March 2007 & TCSPC Microscopy Workshop, St. Ingber, Germany, 15 June 2007.

2. P T C So, "Two-Photon Deep Tissue Imaging", Orthopedic Society Annual Meeting, San Francisco, CA, 11 February 2007.

3. P T C So, "Applications of High Throughput, High Content Tissue Imaging", ILP Directors' Conference, MIT, Cambridge, MA, 10 May 2007.

4. P T C So, "High Resolution Optical Imaging Using Standing Evanescence Waves", Rice University, Houston, TX, 20 May 2007.

5. P T C So, "Applications of Imaging Techniques in Neurobiology", Picowar Center Retreat, Cape Cod, MA, 30 May 2007.

6. P T C So, "Two-Photon Tissue Cytometry", Universite Lavel, Quebec, Canada, 7 June 2007.

7. P T C So, "Two-Photon Tissue Cytometry: High Throughput, High Content Imaging", ECI Biomedical Optics Conference on Optics for Biotechnology, Medicine and Surgery, Naples, FL, 11 June 2007.

8. P T C So, "High throughput, high content microscopic imaging", ECBO, Munich, Germany, 18 June 2007.

9. P T C So, "Confocal and Two-Photon Imaging for Biomechanics", GEM4, Singapore, 29 June 2007.

10. P T C So, "High Throughput, high content tissue imaging", 3rd Asian and Pacific Rim Symposium on Biophotonics, Cairns, Australia, 10 July 2007.

11. P T C So, "Global Analysis of FLIM-FRET data", TCSPC Workshop, Boston, MA, 14 September 2007.

12. P T C So, "Global Analysis of FLIM, FRET and FCS data", Symposium in Future Stereology, Aarhus, Denmark, 23 September 2007 & University of Virginia, Keck Imaging Center, Workshop on FRET Microscopy, Charlottsville, VA, 8 March 2008.

13. P T C So, "Two-Photon 3D Tissue Cytometry: High Throughput, High Content Imaging", Aarhus University, Department of Histology, Aarhus, Denmark, 24 September 2007 & Hangzhou Daizi University, Department of Mechanical Engineering, Hangzhou, China, 7 January 2008.

14. P T C So, "Frontiers in Optical Biomolecular Imaging", Harvey Mudd College, Physics Department, Claremont, CA, 31 September 2007.

15. P T C So, "Applications of High Throughput Imaging in Dermal Diseases", Melanoma IX, Huntington Beach, CA, 1 October 2007.

16. P T C So, "Research and Teaching in Massachusetts Institute of Technology", Hangzhou Daizi University, Hangzhou, China, 7 January 2008.

17. P T C So, "Optical Imaging Technologies for Neurobiology", Portugal-MIT Program, Lisbon, Portugal, 24 January 2008.

18. Y-H Kim, "Super-Resolution Imaging Using Standing Evanescence Waves", Institute of Biological Engineering Conference, Chapel Hill, NC, 7 March 2008.

19. P T C So, "Advances in High Resolution, High Content Optical Biomolecular Imaging", University of Illiniois, Department of Mechanical Engineering, Urbana, IL, 10 March 2008.

20. P T C So, "High Throughput Tissue Imaging and Bioinformatics", OSA Biomedical Topical Meeting 2008, St. Petersburg, FL, 18 March 2008.

21. E Chung, "Toward the standing wave surface plasmon resonance fluorescence microscopy", BIOS, SPIE, San Jose, CA, 20 January 2007.

22. W-L Chen, "Second-harmonic generation investigation of collagen thermal denaturation", BIOS, SPIE, San Jose, CA, 20 January 2007.

23. C J R Sheppard, "Recent advances in pupil filters", Focus on Microscopy 2007, Valencia, Spain, 10-13 April 2007.

24. C J R Sheppard, "Modeling and reconstruction in 3D microscopy", International Workshop on Digital Holographic Reconstruction and Optical Tomography for Engineering Applications, University of Loughborough, Proceedings, pp. 79-83, 23-25 May 2007.

25. C J R Sheppard & E Y S Yew, "Second harmonic generation microscopy with linearly and radially polarized light", Asia-Pacific Biophotonics Conference APBP2007, Cairns, Australia, 9-11 July 2007.

26. C J R Sheppard, "Introduction to confocal microscopy", EMBO Workshop on F Techniques, Singapore, 19 June 2007.

27. C J R Sheppard, "Three dimensional microscopic imaging", International Conference on Lasers and Applications (ICOLA2007), Yogyakarta, Indonesia, 5-6 September 2007.

28. C J R Sheppard, "Developments in modern microscopy", Graduate Students Symposium in Biological and Chemical Engineering, NUS, 14 September 2007 & seminar at Marine Biology Laboratory, Wood's Hole, 18 September 2007.

29. C J R Sheppard, "Optical imaging of grating structures and photonic crystals", European Optical Society Topical Meeting on Optical Microsystems, Capri, 30 Sept-3 Oct 2007.

30. C J R Sheppard, "Three dimensional image formation", ICO Topical Meeting on Optics and Laser Applications in Medicine and Environmental Monitoring for Sustainable Development (OPTOLASERMED 2007) Cape Coast, Ghana, 19-24 November 2007.

31. C J R Sheppard, "Three-dimensional imaging", The 3rd Tohoku-NUS Joint Symposium on Nano-Biomedical Engineering in the East Asian-Pacific Rim Region, 10-11 December 2007.

32. C J R Sheppard, "Spatio-temporal diffraction effects in focused pulsed beams", 5th Asian Conference on Ultrafast Phenomena, Singapore, 7-9 January 2008.

33. C J R Sheppard, "3D imaging by confocal microscopy", Science and Technology Fest, Singapore, 31 January 2008.

34. C J R Sheppard, C H Wong, L B Liu & N G Chen, "Focal Modulation Microscopy (FMM): A new method to increase penetration depth in confocal fluorescence", Focus on Microscopy FOM08, Awaji island, Japan, 13-16 April 2008.

35. C J R Sheppard, "Imaging from the micro to the nano regimes", New frontiers in micro and nano photonics, Florence, Italy, 23-26 April 2008.

36. C J R Sheppard, "Three-dimensional microscopy and imaging through scattering media", seminar at Singapore Eye Research Institute, 17 Jan 2007.

37. C J R Sheppard, "Bioengineering at NUS", seminar at Dept. Engineering Science, University of Oxford, 27 April 2007.

38. C J R Sheppard, "Research in Bioengineering at NUS", seminar at Boston University, 26 September 2007 & MIT, 27 September 2007 & Universita Roma 3, 5 October 2007.

39. C J R Sheppard, "Three dimensional optical imaging and reconstruction", seminar at MIT, 27 September 2007.

**(4) IUP: Computational Tools for Imaging and Analyzing Tissue Response**

***Journal Publications***

J P Bardhan, M D Altman, D J Willis, S M Lippow, B Tidor & J K White, "Numerical Integration Techniques for curved-Element Discretizations of Molecule-Solvent Interfaces", The Journal of Chemical Physics, Vol. 127, pp. 014701, 7 July 2007.

***Conference Publications***

1. P Q Chen, "Simulation of moving interface in micro-fluidics using the boundary element method", Singapore-MIT Alliance (SMA) Workshop on BioMEMS Micro/Nano-flidic devices: Simulation and Experimentation, Singapore, 25 July 2007.

2. S Y Wang, P Q Chen, K M Lim & B C Khoo, "A Mass Conservative Coupling Approach for Fluid-Structure Interaction Simulation of Living Cells", 5th International Symposium on Nanomanufacturing, Singapore, 23 – 25 January 2008.

3. J P Bardhan, M D Altman, J White & B Tidor, "Efficient Optimization of Electrostatic Interactions Between Biomolecules", 46th IEEE Conference on Decision and Control, New Orleans, Louisiana, pp. 4563-4569, December 2007.

4. B Kim, B Tidor & J White, "Robust optimization for biological network calibration", (Poster presentation), 12th Annual International Conference on Research in Computational Molecular Biology (Recomb2008), Singapore, March 2008.

**(5) IUP: Advanced Computational Image Analysis**

***Journal Publications***

1. R Welsch, J Su, X Jiang, G Whitesides & P So, "Geometric Confinement Influences Cellular Mechanical Properties I – Adhesion Area Dependence", Molecular Cellular Biomechanics, Vol. 4, Issue 2, pp. 87-107, 2007.

2. R Welsch & R Menjoge, "Comparing and Visualizing Gene Selection and Classification Methods for Microarray Data", chapter 4 of Machine Learning in Bioinformatics edited by J Rajapakse & Y Zhang. (submitted)

3. J C Rajapakse, "Pattern recognition in bioinformatics", IEEE Engineering in Medicine and Biology Magazine (accepted).

4. J C Rajapakse, Y Wang, X Zheng, J Zhou, "Probabilistic framework for brain connectivity from functional MR images", IEEE Transactions on Medical Imaging (accepted).

5. J C Rajapakse, S L Ho, Pooja & C Chen, "Discovery of conserved regions by comparative genomics", IEEE Engineering in Medicine and Biology Magazine (accepted).

6. J C Rajapakse, J Ma & M N Nguyen, "Gene classification using codon usage bias and support vector machines", IEEE/ACM Transactions on Computational Biology and Bioinformatics, (Accepted).

7. J C Rajapakse & A Kumar, "Power spectral based detection of brain activation from fMR images", Neural Computing & Applications, Vol. 16, Issue 6, pp. 551-557, October 2007.

8. J C Rajapakse & C Chen, "Grid-enabled BlastZ: applications to comparative genomics", Journal of VLSI Signal Processing Systems, Vol. 48, Issue 3, pp. 301-309, September 2007.

9. J C Rajapakse & J Zhou, "Learning effective brain connectivity with dynamic Bayesian networks", NeuroImage, Vol. 37, Issue 3, pp. 749-760, 1 September 2007.

10. J C Rajapakse, Y Zhang & G Fogel, "Guest Editor's Introduction to the special section: computational intelligence approaches in computational biology and bioinformatics", IEEE/ACM Transactions on Computational Biology and Bioinformatics, Vol. 4, No. 2, pp. 161-2, April-June 2007.

***Conference Publication***

1. R Welsch, "Robust Financial Portfolio Design", University of Dortmund Workshop in Honor of Frank Hampel, Dortmund, Germany, March 2007 (Invited).

2. R Welsch, "Visualization and Analysis of High Resolution Cell Image Data", Interface Conference on Computer Science and Statistics, Pasadena, CA, May 2007.

3. R Welsch, R Menjoge & D Nguyen, "Robust Estimation or Robust Optimization for Portfolio Selection: Which Should You Use?" Bulletin of the International Statistical Institute 56$^{th}$ Session Meetings, Lisbon, Portugal, August 2007, CPM019.

4. R Welsch, "Will Robust Optimization Replace Robust Estimation?" International Conference on Robust Statistics, Buenos Aires, Argentina, September 2007.

5. R Welsch, "Visualization and Diagnostics for R", International Workshop on Robust Statistics and R, Banff International Research Station for Mathematical Innovation and Discovery (BIRS), Banff, Canada, October 2007 (Invited).

6. Samarov, "Dimensionality reduction models in density estimation and classification", at the 56$^{th}$ Session of International Statistical Institute in Lisbon, Portugal, August 2007.

7. K Sri & J C Rajapakse, "Extracting brain rhythms with ICA-R", WCCI-International Joint Conference on Neural Networks (IJCNN), June 1-6.

8. S Liu & J C Rajapakse, "Protein localization on cellular images with Markov random filed", WCCI-International Joint Conference on Neural Networks (IJCNN), June 1-6.

9. J Zhou & J C Rajapakse, "Modeling individual variability of functional connectivity", Proceedings of 2$^{nd}$ IAPR Workshop on Pattern Recognition in Bioinformatics (PRIB 2007), Singapore, 1-2 Oct 2007.

10. K Swathi Sri & J C Rajapakse, "Detecting brain waves using ICA-R", Proceedings of 2nd IAPR Workshop on Pattern Recognition in Bioinformatics (PRIB 2007), Singapore, 1-2 Oct 2007.

11. S Liu & J C Rajapakse, "Features for protein localization in microscopic cellular images", Proceedings of 2nd IAPR Workshop on Pattern Recognition in Bioinformatics (PRIB 2007), Singapore, 1-2 Oct 2007.

12. J Chen & J C Rajapakse, "Clustered nuclei segmentation by marker-controlled watershed algorithm", Proceedings of 2nd IAPR Workshop on Pattern Recognition in Bioinformatics (PRIB 2007), Singapore, 1-2 Oct 2007.

***Book Chapters***

1. B Zheng & J C Rajapakse, "Anatomical connectivity analysis using sequential sampling and resampling", J C Rajapakse, B Schmidt, G Volkert (Eds.), Pattern Recognition in Bioinformatics, Lecture Notes in Bioinformatics, LNBI 4774.

2. A Kumar & J C Rajapakse, "Time-frequency method base activation detection in functional time-series", J C Rajapakse, B Schmidt, G Volkert (Eds.), Pattern Recognition in Bioinformatics, Lecture Notes in Bioinformatics, LNBI 4774.

3. P Mundra & J C Rajapakse, "SVM-RFE with MRMR criteria for gene classification", J C Rajapakse, B Schmidt, G Volkert (Eds.), Pattern Recognition in Bioinformatics, Lecture Notes in Bioinformatics, LNBI 4774, 242-252.

4. M N Nguyen, J C Rajapakse & K B Duan, "Amino acid features for prediction of protein-protein interface residues with support vector machines", E Marchiori, J H Moore & J C Rajapakse (Eds.), Evolutionary Computation, Machine Learning, and Data Mining in Bioinformatics, Lecture Notes of Computer Science, LNCS 4447, pp. 287-296, Springer-Verlag Berlin Heidelberg 2007.

5. K B Duan, J C Rajapakse & M N Nguyen, "One-versus-one and one-versus-all multiclass SVM-RFE for gene selection in cancer classification", E Marchiori, J H Moore & J C Rajapakse (Eds.), Evolutionary Computation, Machine Learning, and Data Mining in Bioinformatics, Lecture Notes of Computer Science, LNCS 4447, pp. 47-56, Springer-Verlag Berlin Heidelberg 2007.

# SINGAPORE-MIT ALLIANCE
# SMA-2 PUBLICATIONS

## CE programme (AY 2007/2008)

### 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 2007/2008

***Journal Publications***

1. Le D V, Rosales C, Khoo B C & Peraire J, "Numerical design of electrical-mechanical traps", Lab On A Chip, Vol. 8, Issue 5, pp. 755-763, 1 April 2008.

2. Mittal N, Rosenthal A & Voldman J, "nDEP microwells for single-cell patterning in physiological media", Lab on a Chip, Vol. 7, Issue 9, pp. 1146-1153, 10 July 2007.

3. Kovac J R & Voldman J, "Intuitive, Image-Based Cell Sorting Using Optofluidic Cell Sorting", Analytical Chemistry, Vol. 79, Issue 24, pp. 9321-9330, 15 December 2007.

4. Duong-Hong D, Wang J S, Liu G R, Chen Y Z, Han J Y & H NG, "Dissipative particle dynamics simulations of electroosmotic flow in nano-fluidic devices", Microfluidics and Nanofluidics, Vol. 4, Issue 3, pp. 219-225, March 2008.

5. Li Z R, Liu G R, Chen Y Z, Wang J S, Han J Y & H NG, "Continuum transport model of Ogston sieving in patterned nanofilter arrays for separation of rod-like biomolecules", Electrophoresis, Vol. 29, Issue 2, pp. 329-339, January 2008.

6. Rong Wang, Chen Y Z, Wang J S, Liu G R & Han J Y, "Simulation of DNA Electrophoresis in Systems of Large Number of Solvent Particles by Coarse-Grained Hybrid Molecular Dynamics Approach", Journal of Computational Chemistry, Accepted, 23 April 2008.

7. Han J, Fu J & Schoch R B, "Molecular Sieving Using Nanofilters: Past, Present and Future", Lab on a Chip, Vol. 8, Issue 1, pp. 23-33, January 2008.

8. Kuo S, Tidor B & White J, "A Meshless, Spectrally-Accurate Integral Equation solver for Molecular Electrostatics", The ACM Journal of Emerging Technologies in Computing Systems (JETC) (The ACM Transaction on Design Automation of Electronic Systems (TODAES)), Vol. 4, Issue 2, Article 6, April 2008.

9. Coelho C, Silveira L M & White J, "Efficient Tools for the Calculation of Drag Forces on Planar Microelectromechanical Systems", Journal on Microelectromechanical Systems, Vol. 17, Issue 3, pp. 558 – 572, 6 June 2008.

***Conference Publications***

1. Cui H, Lim K M & Voldman J, "Experiment and Modeling of SU-8 Pillar Array Micro-Traps with Negative Dielectrophoresis", 5th International Symposium on Nanomanufacturing, Singapore, January 2008.

2. Le D V, Rosales C, Khoo B C, Lim K M & Peraire J, "A Coupled IBM-BEM Numerical Method for the Optimization of Single-Cell Traps", 5th International Symposium on Nanomanufacturing, Singapore, January 2008.

3. Taff B M, Desai S P & Voldman J, "Dielectrophoretically Switchable Microfluidic Weir Structures for Exclusion-Based Single-Cell", Micro Total Analysis Systems 2007, Paris, France, October 2007.

4. Vahey M D, Barsotti R J, Wartena R, Chiang Y M, Stellacci F & Voldman J, "Modeling The Electrokinetics of Nanoparticles for Controlled Assembly", Micro Total Analysis Systems 2007, Paris, France, October 2007.

5. Desai S P, Taff B M & Voldman J, "A Photopatternable Silicone for Biomems Applications", Micro Total Analysis Systems 2007, Paris, France, October 2007 & Biomedical Engineering Society Annual Meeting, Los Angeles, CA, USA, September 2007.

6. Taff B M & Voldman J, "Electromechanically active hydrodynamic arrays for single-cell manipulation", Biomedical Engineering Society Annual Meeting, Los Angeles, CA, USA, September 2007.

7. Le D V, White J, Peraire J, Lim K M & Khoo B C, "An implicit Immersed Boundary Method for three-dimensional membrane-fluid flow interactions", 8th World Congress on Computational Mechanics (WCCM 08), Venice, Italy, June 2008.

8. Bardhan J, Altman M D, White J & Tidor B, "Efficient Optimization of Electrostatic Interactions Between Biomolecules", 46th IEEE Conference on Decision and Control, New Orleans, Louisiana, December 2007.

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

***Journal Publications***

1. N C Nguyen & J Peraire, "An efficient reduced-order modeling approach for nonlinear parametrized partial differential equations", International Journal for Numerical Methods in Engineering, Accepted, 20 December 2007.

2. M A Grepl, Y Maday, N C Nguyen & A T Patera, "Efficient reduced basis treatment of nonaffine and nonlinear partial differential equations", ESAIM-Mathematical Modeling and Numerical Analysis (M2AN), Vol. 41, Issue 3, pp. 575-605, 2 August 2007.

3. Y Maday, N C Nguyen, A T Patera & G S H Pau, "A general, multipurpose interpolation procedure: the magic points", Constructive Approximation, Accepted, 20 December 2007.

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

***Journal Publications***

1. D Bertsimas, O Nohadani & K M Teo, "Robust Optimization in Electromagnetic Scattering Problems", Journal of Applied Physics, Vol. 101, Issue 7, pp. 074507, 13 April 2007.

2. D Bertsimas & K Natarajan, "A Semidefinite Approach to the Steady-State Analysis of Queuing Systems", Queueing Systems, Vol. 56 (1), pp. 27-39, May 2007.

# SINGAPORE-MIT ALLIANCE
# SMA-2 PUBLICATIONS

## CE programme (AY 2007/2008)

### (B) Non-collaborative Publications

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

### AY 2007/2008

***Journal Publications***

1. Wang S Y, Lim K M, Khoo B C & Wang M Y, "On hole nucleation in topology optimization using level set methods", Computer Modeling in Engineering and Sciences, Vol. 21, No. 3, pp. 219-238, 2007.

2. Wang S Y, Lim K M, Khoo B C & Wang M Y, "An unconditionally time-stable level set method and its application to shape and topology optimization", Computer Modeling in Engineering and Sciences, Vol. 21, No. 1, pp. 1-40, 2007.

3. Wang S Y, Lim K M, Khoo B C & Wang M Y, "A hybrid sensitivity filtering method for topology optimization", Computer Modeling in Engineering & Sciences, Vol. 24, No. 1, pp. 21-50, 2008.

4. Le D V, Khoo B C & Lim K M, "An implicit-forcing immersed boundary method for simulation viscous flows in irregular domains", Computer Methods in Applied Mechanics and Engineering, Vol. 197, Issue 25-28, pp. 2119-2130, 15 April 2008.

5. Tan Z J, Lim K M & Khoo B C, "An Adaptive Moving Mesh Method for Two-dimensional Incompressible Viscous Flows", Communications in Computational Physics, Vol. 3, Issue 3, pp. 679-703, March 2008.

6. Tan Z J, Lim K M & Khoo B C, "An Adaptive Mesh Redistribution Method for the Incompressible Mixture Flows Using Phase-Field Model", Journal of Computational Physics, Vol. 225, Issue 1, pp. 1137-1158, 1 July 2007.

7. Abgrall P, V Conedera, H Camon, A M Gue & N T Nguyen, "SU-8 as a Structural Material for Lab-on-chips and Microelectromechanical Systems", Electrophoresis, Vol. 28, No. 24, pp. 4539-4551, 17 July 2007.

8. Abgrall P & N T Nguyen, "Nanofluidic Devices and Their Applications", Analytical Chemistry, Vol. 80 (7), pp. 2326-2341, 1 April 2008.

***Conference Publications***

1. He X F, Lim K M & Lim S P, "Comparison of two FFT-BEMs for Poisson-type equation", 8th World Congress on Computational Mechanics, Venice, Italy, June 2008.

2. Mehta K B & Lim K M, "DEP based Lab on a chip: Dielectrophoretic force calculation", Mini-Symposium, Global Nano-Biomedical Engineering Education and Research Network Centre, Sendai, Japan, May 2008.

3. Cui H H, Lim K M, Lim S P, Khoo B C & Voldman J, "Microparticle separation using dynamic pulsed dielectrophoresis", 22nd International Symposium on Microscale Bioseparations, Berlin, Germany, March 2008.

4. He X F, Lim S P & Lim K M, "A fast Stokes solver based on fast Fourier transform on multipoles (FFTM)", 5th International Symposium on Nanomanufacturing, Singapore, January 2008.

5. Wang S Y, Chen P Q, Lim K M & Khoo B C, "A Mass Conservative Coupling Approach for Fluid-Structure Interaction Simulation of Living Cells", 5th International Symposium on Nanomanufacturing, Singapore, January 2008.

6. Tan Z J, Le D V, Lim K M & Khoo B C, "An Immersed Interface Method for the Navier-Stokes Equations with Discontinuous Viscosity and Singular Forces", 5th International Symposium on Nanomanufacturing, Singapore, January 2008.

7. Nguyen N T & Abgrall P F A, "Fabrication of Nanochannels in Silicon and Polymers", ASME Micro/Nanoscale Heat Transfer International Conference, Tainan, Taiwan, MNHT2008-52063, January 2008.

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

***Journal Publications***

1. G Strang, "Starting with two matrices", submitted to American Mathematical Monthly, 2008.

2. G Strang, S Dharmaraja & Y Wang, "Optimal stability for trapezoidal-backward difference split-steps", IMA Journal Numerical Analysis (to appear 2009).

3. T Bui-Thanh, K Willcox & O Ghattas, "Model Reduction for Large-Scale Systems with High-Dimensional Parametric Input Space", SIAM Journal on Scientific Computing, to appear.

4. T Bui-Thanh, K Willcox & O Ghattas, "Parametric Reduced-Order Models for Probabilistic Analysis of Unsteady Aerodynamic Applications", American Institute of Aeronautics and Astronautics Journal, submitted.

5. N C Nguyen, "A posteriori error estimation and basis adaptivity for reduced basis approximation of nonaffine-parametrized linear elliptic partial differential equations", Journal of Computational Physics, Vol. 227, Issue 2, pp. 983-1006, 10 December 2007.

6. N C Nguyen, "A multiscale reduced-basis method for parametrized elliptic partial differential equations with multiple scales", Journal of Computational Physics, 2007, Accepted.

7. N Raj Rao, J Mingo, R Speicher & A Edelman, "Statistical Inference from Large Wishart Matrices", Annals of Statistics, Accepted for publication, 2008.

8. C Chan, V Drensky, A Edelman, R Kan & P Koev, "On Computing Schur Functions and Series thereof", Submitted to Journal of Algebraic Combinatorics

**(3) IUP: Advanced Optimization Methods: Theory and Computation for Emerging Applications**

***Journal Publications***

1. K C Toh, R H Tutuncu & M J Todd, "Inexact primal-dual path-following algorithms for a special class of convex quadratic SDP and related problems", Pacific Journal of Optimization, Vol. 3, No. 1, pp. 135-164, January 2007.

2. K C Toh, "An inexact primal-dual path-following algorithm for convex quadratic SDP", Mathematical Programming, Vol. 112, Issue 1, pp. 221-254, July 2007.

3. Z X Chan & D Sun, "Constraint nondegeneracy, strong regularity and nonsingularity in semidefinite programming", SIAM Journal on Optimization, Accepted.

4. 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, Issue 3, pp. 385 – 392, May 2008.

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

# SINGAPORE-MIT ALLIANCE
# SMA-2 PUBLICATIONS

***Journal Publications***

1. E Adida & G Perakis, "Dynamic Pricing and Inventory Control with no Backorders; Open versus Closed Loop, Robust versus Stochastic Optimization", submitted to INFORMS Journal on Computing, 2007.

2. A Farahat & G Perakis, "A Comparison of Bertrand and Cournot Profits in Oligopolies with Differentiated Products", submitted and revised to Management Science, 2007.

3. D Bertsimas & D Brown, "Constrained Stochastic LQC: A Tractable Approach", IEEE Transactions on Automatic Control, Vol. 52 (10), pp. 1826-1841, October 2007.

4. Z Huang & J Sun, "A Smoothing Newton Algorithm for the LCP with a Sufficient Matrix that terminates finitely at a maximally complementary solution", Optimization Methods and Software, Vol. 21, Issue 4, pp. 597-615, 1 August 2006.

5. T Huh, R Levi, P Rusmevichientong & J Orlin, "Adaptive Data-Driven Inventory Control Policies Based on Kaplan-Meier Estimator", submitted to Operations Research.

6. S Kachani, G Perakis & C Simon, "An MPEC Approach to Dynamic Pricing for Perishable Products in Oligopoly Markets", submitted and revised for SIAM Journal on Optimization, 2008.

7. R Levi, A Lodi & M Sviridenko, "Approximation Algorithms for the Multi-Item Capacitated Lot-Sizing Problem Via Flow-Cover Inequalities", to appear in Mathematics of Operations Research, 2007.

8. R Levi, R Roundy, D Shmoys & M Sviridenko, "A Constant Approximation Algorithm for the One-Warehouse-Multi-Retailer Problem", Management Science, Accepted, 2008.

9. R Levi, R Roundy, D Shmoys & V A Truong, "Approximation Algorithms for Capacitated Stochastic Inventory Models", Operations Research, Accepted, 2008.

10. G Even, R Levi, D Rawitz, B Schieber, S Shahar & M Sviridenko, "Algorithms for Capacitated Rectangle Stabbing and Lot-Sizing with Joint Set-Up Costs", to appear in Transactions on Algorithms, 2008.

11. R Levi, G Janakiraman & M Nagarajan, "A 2-Approximation Algorithm for Stochastic Inventory Control Models with Lost-Sales", Mathematics of Operations Research, Accepted, 2008.

12. R Levi, R Roundy & D Shmoys, "Provably Near-Optimal Sampling-Based Policies for Stochastic Inventory Control Models", Mathematics of Operations Research, Vol. 32 (4), pp. 821-838, November 2007.

13. R Levi, M Pal, R Roundy & D Shmoys, "Approximation Algorithms for Stochastic Inventory Control Models", Mathematics of Operations Research, vol. 32 (2), pp. 284-302, May 2007.

14. K Natarajan, D Pachamanova & M Sim, "Incorporating Asymmetric Distributional Information in Robust Value-at-Risk Optimization", Management Science, Vol. 54, No. 3, pp. 573 – 585, March 2008.

15. K Natarajan & L Zhou, "A Mean-Variance Bound for a Three-Piece Linear Function", Probability in Engineering and Informational Sciences, Vol. 21, No. 4, pp. 611-621, October 2007.

16. G Perakis & G Roels, "Robust Revenue management; A Regret Approach", Submitted & Revised to Manufacturing & Service Operations Management, 2007.

17. C See & M Sim, "Robust Approximation to Multi-Period Inventory Management", Under review in Operations Research, 2007.

18. D Sui & C J Ong, "Constrained Piecewise Linear Systems with Disturbance: Controller Design via Convex Invariant Sets", International Journal of Robust and Nonlinear Control, Accepted, 2008.

19. J Sun & Z Huang, "A Non-Interior Continuation Algorithm for the P0 or P* LCP with Strong Global and Local Convergence Properties", Applied Mathematics and Optimization, Vol. 52, Issue 2, pp. 237 – 262, 2005.

20. J Sun, L Zhang & Y Wu, "Properties of the Augmented Lagrangian in Nonlinear Semidefinite Optimization", Journal of Optimization Theory and Applications, Vol. 129, No. 3, pp. 437-456, June 2006.

21. C Wang, C J Ong & M Sim, "Constrained linear system with disturbance: convergence under disturbance feedback", Accepted in Automatica, 2008.

***Conference Publications***

1. C Wang, C J Ong & M Sim, "Model predictive control using affine disturbance feedback for constrained linear system", in Proceedings of the 46$^{th}$ IEEE Conference on Decision and Control, pp. 1275-1280, 2007.

2. C Wang, C J Ong & M Sim, "Model Predictive Control Using Segregated Disturbance Feedback", in Proceedings of the American Control Conference, 2008.

# SINGAPORE-MIT ALLIANCE
# SMA-2 PUBLICATIONS

## MST programme (AY 2007/2008)

### 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 2007/2008

***Journal Publications***

1. D J Burns & K Youcef-Toumi, "Shortening Carbon Nanotube-Tipped AFM Probes", International Journal of Nanomanufacturing, Vol. 1 (6), pp. 799-809, December 2007.

2. Fu G, S B Tor, N H Loh, B Y Tay & D E Hardt, "A Micro Powder Injection Molding apparatus for high aspect ratio metal micro-structures production", Journal of Micromechanics and Microengineering, Vol. 17, pp. 1803 – 1809, 8 August 2007.

3. Fu G, Li S G, Reading I, Chaturvedi P, Tor S B, Yoon S F & Youcef-Toumi K, "Investigation of the Dimensional Variation of Microstructures Through the uMIM Process", International Journal of Nanomanufacturing, Accepted.

4. Fu G, S B Tor, N H Loh, B Y Tay & D E Hardt, "The demolding of powder injection molded micro-structures: analysis, simulation and experiment", Journal of Micromechanics and Microengineering, Vol. 18, Issue 7, pp. 075024, 13 June 2008.

***Conference Publications***

1. V Shilpiekandula & K Youcef-Toumi, "A Flexure-based Mechanism for Precision Angular Alignment at Large Loads", American Society for Precision Engineering Annual Meeting, Portland OR, Accepted, October 2008.

2. V Shilpiekandula & K Youcef-Toumi, "Fixturing Optical Flats with Minimal Distortion and Error-Motions", American Society for Precision Engineering Annual Meeting, Portland OR, Accepted, October 2008.

3. V Shilpiekandula & K Youcef-Toumi, "Characterization of Dynamic Behavior of Flexure-based Mechanisms for Precision Angular Alignment", American Control Conferene, Seattle WA, Accepted, June 2008.

4. S Li, Z 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", SPIE, Vol. 6993, pp. 69930F1-12, April 2008.

5. V Shilpiekandula, D J Burns & K Youcef-Toumi, "An Instrument Transfer Function Approach to Atomic Force Microscopy for surface metrology", 5th International Symposium on Nanomanufacturing, January 2008.

6. Z Xu, S G Li, S F Yoon, K Youcef-Toumi, D J Burns, V Shilpiekandula, H K Taylor & D S Boning, "Complete surface distinguishing and overlapping technology for three-dimensional image processing of micro devices", 5th International Symposium on Nanomanufacturing, January 2008.

7. J Y Lai, V Shilpiekandula & K Youcef-Toumi, "A Flexural mechanism for Passive Angle Alignment and Locking In Nanomanufacturing Applications", 5th International Symposium on Nanomanufacturing, Singapore, January 2008.

8. A D Mazzeo & D E Hardt, "Toward the manufacture of micro and nano features with curable liquid resin: mold materials and part-to-part dimensional variation", ISNM and SMA Symposium, January 2008.

9. A D Mazzeo, N Diaz, M Dirckx & D E Hardt, "Single-step through-hole punching and double-sided hot embossing of microfluidic channels", ICOMM, September 2007.

10. S G Li, T Thorsen, Z G Xu, Z P Fang, S F Yoon, I Reading, V Shilpiekandula & K Youcef-Toumi, "Microvalve thickness measurements in multilayer microfluidic devices with chromatic confocal microscopy", 5th International Symposium on Manufacture, Singapore, 22 January 2008.

11. S Kumar, S Das & T Thorsen, "Thermal modeling for design optimization of a microfluidic devices for continuous flow polymerase chain reaction", Proceedings of the ASME Summer Heat Conference, 12 August 2008.

12. H K Taylor & D S Boning, "An integrated crack-opening method for determining the work of fracture of bonded polymer interfaces", Micro Total Analysis systems, October 2008.

13. H K Taylor, Xu Z G, Li S G, K Youcef-Toumi, S F Yoon & D S Bonding, "Moire fringe method for the measurement of distortions of hot-embossed polymeric substrates", 9th International Symposium on Laser Metrology, July 2008.

14. H K Taylor & D S Boning, "Diffraction-based approaches to the in-situ measurement of dimensional variations in components produced by thermoplastic micro- and nano-embossing", 5th International Symposium on Nanomanufacturing, January 2008.

15. H K Taylor, D S Boning, C Iliescu & B Chen, "Computationally efficient modeling of pattern dependencies in the micro-embossing of thermoplastic polymers", 33rd International Conference on Micro- and Nano-Engineering. Proceedings paper: Microelectronic Engineering, Vol. 85, pp. 1453-6, 2008. September 2007.

16. Matthew Dirckx, Aaron D Mazzeo & David E Hardt, "Evaluation of thermoplastic materials for hot micro-embossing tooling", 5th International Symposium on Nanomanufacturing, January 2008.

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

***Journal Publications***

1. J Gallien, J Foreman, R Bhatnagar & C C Teo, "Dynamic Supply Routing for a Make-To-Order Manufacturing Network", Submitted to Manufacturing and Service Operations Management, 2008.

***Conference Publications***

J Gallien, J Alspaugh, R Bhatnagar, J Foreman & C C Teo, "Dynamic Supply Routing for a Make-To-Order Manufacturing Network", Presented at INFORMS Annual Meeting, Seattle, 2007 & To appear in the Proceedings of the 2008 Manufacturing and Service Operations Management Conference, Baltimore, MD, 2008.

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

***Conference Publications***

W L See Tristan, A I Sivakumar & C Graves Stephen, "An Analytical Model to Evaluate and Minimize the Manufacturing Systems Cost for Microfluidics Devices", 5th International Symposium on Nanomanufacturing 2008, A40.

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

# SINGAPORE-MIT ALLIANCE
# SMA-2 PUBLICATIONS

***Journal Publications***

1. C Qi, A I Sivakumar & S B Gershwin, “Impact of Production Control and System Factors in Semiconductor Wafer Fabrication”, to appear in IEEE Transactions on Semiconductor Manufacturing, Accepted, Feb 2008.

2. C Qi, A I Sivakumar & S B Gershwin, “Impact of Job Release Control and Dispatching in Semiconductor Wafer Fabrication”, Production Planning and Control, Accepted, Mar 2008.

## MST programme (AY 2007/2008)

### (B) Non-collaborative Publications

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

### AY 2007/2008

***Journal Publications***

S Li, Z Xu, I Reading, S F Yoon, Z P Fang & J H Zhao, "Three Dimensional Sidewall Measurements by Laser Fluorescent Confocal Microscopy", Optics Express, Vol. 16 (6), pp. 4001-4014, 11 March 2008.

***Conference Publications***

1. S B Tor, N H Loh, G Fu & B Y Tay, "Experimental study on the demolding force in Micro Metal Injection Molding", SMA Symposium 2007, January 2007.

2. G Fu, S B Tor, N H Loh & B Y Tay, "Micro Hot-embossing of 316L Stainless Steel Micro-structures", 5th International Symposium on Nanomanufacturing, January 2007.

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

***Journal Publications***

1. K P Li, A I Sivakumar & V K Ganesan, "Complexities and Algorithms for Synchronized Scheduling of Parallel Machine Assembly and Air Transportation in Consumer Electronics Supply Chain", European Journal of Operational Research (Netherlands), Vol. 187, Issue 2, pp. 442 – 455, 1 June 2008.

2. K P Li, V K Ganesan & A I Sivakumar, "Scheduling of single stage assembly with air transportation in a consumer electronic supply chain", Computers and Industrial Engineering, Vol. 51, No. 2, pp. 264 – 278, October 2006.

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

***Journal Publications***

A T H Ang, A I Sivakumar & C Qi, "Criteria Selection and Analysis for Single Machine Dynamic Online Scheduling with Multiple Objectives and Sequence Dependent Setups", Computers and Industrial Engineering, Accepted, Feb 2008.

***Conference Publications***

C Qi, A I Sivakumar & V K Ganesan, "Markov Process Modeling of a System under WIPLOAD Control", Singapore-MIT Alliance (SMA) Annual Symposium 2005, Presented, Singapore, January 2005.

## CPE programme (AY 2007/2008)

### 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 2007/2008

***Journal Publications***

1. P K Ajikumar, K Tyo, M Oliver, H P Too & G Stephanopoulos, "Terpenoids: opportunities for biosynthesis of natural product drugs using engineered microorganisms", Molecular Pharmaceutics, Vol. 5, Issue 2, pp. 167, April 2008.

2. D Klein-Marcuschamer, P K Ajikumar & G Stephanopoulos, "Engineering microbial cell factories for biosynthesis of isoprenoid molecules: beyond lycopene", Trends in Biotechnology, Vol. 25, Issue 9, pp. 417 – 424, September 2007.

3. B Olle, Bucak S, Holmes T C, Bromberg L, T A Hatton & Wang I C, "Enhancement of Oxygen Transfer Using Functionalized Magnetic Nanoparticles", Industrial and Engineering Chemistry Research, Vol. 45, Issue 12, pp. 4355-4363, 7 June 2006.

4. Wei Zhang, Kevin O' Connor, Daniel I C Wang & Zhi Li, "Efficient Recycling of NADPH in Enantioselective Bioreduction With Coupled Permeabilized Microorganisms", Advanced Synthesis & Catalysis, Accepted.

5. Jie Chen & Bernhardt L Trout, "Computational study of solvent effects on the Molecular Self-Assembly of tetrolic acid in solution and implications for the polymorph formed from crystallization", Journal Physical Chemistry B, Vol. 112 (26), pp. 7794 – 7802, 3 July 2008.

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

***Journal Publications***

1. S K Ng, D I C Wang & M G S Yap, "Application of destabilization of selection markers for improved recombinant protein productivity in CHO-DG44", Metabolic Engineering, Vol. 9, Issue 3, pp. 304-316, May 2007.

2. H K Tan, M M Lee, M G S Yap & D I C Wang, "Over-Expression of Cold-Inducible RNA-Binding Protein (CIRP) Increases Interferon-y Production in CHO Cells", Biotechnology and Applied Biochemistry, Accepted, July 2007.

# SINGAPORE-MIT ALLIANCE
# SMA-2 PUBLICATIONS

## CPE programme (AY 2007/2008)

### (B) Non-collaborative Publications

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

### AY 2007/2008

***Journal Publications***

1. *Li J G, Raj R & J J W, "Polymer-Induced Phase Separation and Crystallization in immunoglobulin G Solutions", Journal of Chemical Physics, Vol. 128, Issue 20, pp. 205105, 28 May 2008.

2. Li J G, Raj R & J J W, "Role of solvent in protein phase behavior: Influence of temperature dependent potential", The Journal of Chemical Physics, Vol. 128, Issue 23, pp. 235104, 21 June 2008.

3. *Hu Z Q, J J W & Raj R, "Effects of Macromolecular Crowding on Biochemical Reaction Equilibria: A Molecular Thermodynamic Perspective", Biophysical Journal, Vol. 93, Issue 5, pp. 1464 – 1473, 1 September 2007.

4. Y C Xiao, H M Lim, T S Chung & R Rajagopalan, "Acetylation of β-cyclodextrin surface-functionalized cellulose dialysis membranes with enhanced chiral separation", Langmuir, Vol. 23 (26), pp. 12990-12996, 18 December 2007.

***Conference Publications***

1. *D I C Wang, "Impacts of Micro-Bioreactors in Biotech Processes", Bioprocess Engineering Conference, Wuhan, China, March 2007.

2. D I C Wang, "Bioreactors in Bioprocesses", Jiao Tong University, Shanghai, China, May 2007.

3. *D I C Wang, "Research Challenges in Biochemical Engineering", NSF/China Workshop, Tianjin, China, February 2008.

4. D I C Wang, "Novel Bioreactors Using Magnetic Nanoparticles", International Industrial Biotechnology Conference, Naples, Italy, June 2008.

5. *L J G, J J W & Raj R, "Effect of polymer size and ionic strength on the phase behavior of a model non-globular protein: A molecular simulation study", 4th International Conference on Materials for Advanced Technologies, Singapore, July 2007.

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

***Journal Publications***

1. J G Li, R Rajagopalan & J W Jiang, "Polymer-induced phase separation and crystallization in immunoglobulin G solutions", Journal of Chemical Physics, Vol. 128, Issue 20, pp. 205105, 28 May 2008.

2. Z Q Hu, J W Jiang & R Rajagopalan, "Effects of macromolecular crowding on biochemical reaction equilibria: A molecular thermodynamic perspective", Biophysical Journal, Vol. 93, Issue 5, pp. 1464 – 1473, 1 September 2007.

***Conference Publications***

1. J W Jiang & R Rajagopalan, "Molecular insight into crystallization: From fundamental to application", Singapore-MIT Alliance (SMA) Industry Workshop, Singapore, December 2007.

2. J W Jiang & R Rajagopalan, "Effect of polymer size and ionic strength on the phase behavior of a model non-globular protein: A molecular simulation study", 4th International Conference on Materials for Advanced Technologies, Singapore, July 2007.

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

***Conference Publications***

1. D I C Wang, "Impacts of Micro-Bioreactors in Biotech Processes", Bioprocess Engineering Conference, Hubei University, Wuhan, China, March 2007.

2. D I C Wang, "High Throughput Screening in Biological and Chemical Systems", Genentech Inc., South San Francisco, CA, December 2007.

3. D I C Wang, "Research Challenges in Biochemical Engineering", NSF-China Workshop, Tianjin University, China, February 2008.