Zoya Bylinskii
(formerly Zoya Gavrilov)
Curriculum Vitae

e-mail: zoya@mit.edu; **webpage: http://web.mit.edu/zoya/www/**

Relevant research areas: human-computer interaction, computer vision, machine learning, visualization, human perception & cognition (memory, attention).

EDUCATION

PhD, Massachusetts Institute of Technology   *Feb 2015 – Sept 2018*
   Thesis: "Computational Perception for Multi-modal Document Understanding"
   George M. Sprowls Award for Best PhD Theses in Computer Science
   Computer Science and Artificial Intelligence Laboratory (CSAIL)
   Department of Electrical Engineering and Computer Science (EECS)
   Advisors: Frédo Durand and Aude Oliva

Master of Science, Massachusetts Institute of Technology   *Sept 2012 – Feb 2015*
   Thesis: "Computational Understanding of Image Memorability"
   Advisors: Antonio Torralba and Aude Oliva (CSAIL, EECS)

Honours B.Sc. with High Distinction, University of Toronto   *Sept 2008 – June 2012*
   Major: Computer Science and Statistics Joint Specialist Program
   Advisor: Sven Dickinson

University of Toronto Schools   *Sept 2002 – June 2008*

EXPERIENCE

Research Scientist, Adobe Inc.   *Oct 2018 – Present*
Research Assistant, Massachusetts Institute of Technology   *Feb 2015 – Sept 2018*
Research Intern, Adobe Inc., Creative Technologies Lab, San Francisco   *May – Sept 2016*
Graduate Teaching Assistant, Massachusetts Institute of Technology   *Jan 2015 – Dec 2015*
Undergraduate Research Assistant, University of Toronto   *May – Aug 2010,2011,2012*
Mathematics Tutor, Qualified Tutors, Toronto   *June 2009 – July 2012*
Visiting Researcher, Boston University   *May – Aug 2011*
Summer Research Student, Rotman Research Institute at Baycrest, Toronto   *June 2009 – Aug 2009*

PUBLICATIONS

Refereed publications:

Bylinskii, Z., Judd, T., Oliva, A., Torralba, A., Durand, F. (2018) "What do different evaluation metrics tell us about saliency models?", IEEE Transactions on Pattern Analysis and Machine Intelligence.

Bylinskii, Z., Kim, N.W., O'Donovan, P., Alsheikh, S., Madan, S., Pfister, H., Durand, F., Russell, B., Hertzmann, A. (2017) "Learning Visual Importance for Graphic Designs and Data Visualizations", ACM User Interface Software and Technology Symposium (UIST). ***Honorable Mention Award***.

Kim, N.W.*, **Bylinskii, Z.***, Borkin, M., Gajos, K.Z., Oliva, A., Durand, F., Pfister, H. (2017) "Bubble-View: an interface for crowdsourcing image importance maps and tracking visual attention" ACM Transactions on Computer-Human Interaction (TOCHI).

Bylinskii, Z., Recasens, A., Borji, A., Oliva, A., Torralba, A., Durand, F. (2016) "Where should saliency models look next?", European Conference on Computer Vision (ECCV).

Borkin, M.*, **Bylinskii, Z.***, Kim, N.W., Bainbridge, C.M., Yeh, C.S., Borkin, D., Pfister, H., and Oliva, A. (2015) "Beyond Memorability: Visualization Recognition and Recall", IEEE Transactions on Visualization and Computer Graphics (Proceedings of InfoVis).

Bylinskii, Z., Isola, P., Bainbridge, C., Torralba, A., Oliva, A. (2015) "Intrinsic and Extrinsic Effects on Image Memorability", Vision Research.

Bylinskii, Z., DeGennaro, E., Rajalingham, R., Ruda, H., Zhang, J. Tsotsos, J.K. (2015) "Towards the quantitative evaluation of visual attention models", Vision Research.

Borkin, M., Vo, A., **Bylinskii, Z.**, Isola, P., Sunkavalli, S., Oliva, A., Pfister, H. (2013) "What Makes a Visualization Memorable?", IEEE Transactions on Visualization and Computer Graphics (InfoVis).

Gavrilov, Z., Sclaroff, S., Neidle, C., Dickinson, S. (2012) "Detecting Reduplication in Videos of American Sign Language", Proc. Eighth International Conf. on Language Resources and Evaluation (LREC).

* equal contribution

Book chapters:

Borji, A., Tavakoli, H., **Bylinskii, Z.** (under review). "Models of Bottom-up Attention", Encyclopedia of Computational Neuroscience. Also available as: arXiv:1810.05680.

Bylinskii, Z., Borkin, M., Kim, N.W., Pfister, H., Oliva, A. "Eye Fixation Metrics for Large Scale Evaluation and Comparison of Information Visualizations", Proceedings of Eye Tracking and Visualization (ETVIS 2015), Springer Mathematics and Visualizations series.

Refereed workshop papers and abstracts:

Bylinskii, Z. and Borkin, M. (2015) "Eye Fixation Metrics for Large Scale Analysis of Information Visualizations", First Workshop on Eye Tracking and Visualization (ETVIS 2015).

Kim, N.W., **Bylinskii, Z.**, Borkin, A.M., Oliva, A., Gajos, K.Z., Pfister, H. (2015) "A Crowdsourced Alternative to Eye-tracking for Visualization Understanding", CHI'15 Extended Abstracts.

Vo, M., **Gavrilov, Z.**, Oliva, A. (2013) "Image Memorability in the Eye of the Beholder: Tracking the Decay of Visual Scene Representations", Vision Sciences Society.

Non-refereed publications:

Madan, S.*, **Bylinskii, Z.***, Tancik, M.*, Recasens, A., Alsheikh, S., Pfister, H., Durand, F. (2018) "Synthetically Trained Icon Proposals for Parsing and Summarizing Infographics" arXiv:1807.10441

Bylinskii, Z.*, Alsheikh, S.*, Madan, S.*, Recasens, A.*, Zhong, K., Pfister, H., Durand, F., Oliva, A. (2017) "Understanding Infographics through Textual and Visual Tag Prediction" arXiv:1709.09215

Vo, M. **Bylinskii, Z.**, Oliva, A. (2017) "Image memorability in the eye of the beholder: tracking the decay of visual scene representations" bioRxiv:141044

Lapedriza, A., Pirsiavash, H., **Bylinskii, Z.**, Torralba, A. (2013) "Are all Training Examples Equally Valuable?" arXiv:1311.6510

Theses:

Bylinskii, Z. (2018) "Computational Perception for Multi-modal Document Understanding", MIT PhD Thesis in Electrical Engineering and Computer Science. ***George M. Sprowls Award for Best PhD Theses in Computer Science.***

Bylinskii, Z. (2015) "Computational Understanding of Image Memorability", MIT Master's Thesis in Electrical Engineering and Computer Science.

Benchmarking initiative:

Bylinskii, Z., Judd, T., Borji, A., Itti, L., Durand, F., Oliva, A., Torralba, A. (2014) "MIT Saliency Benchmark", available at: http://saliency.mit.edu

AWARDS and SCHOLARSHIPS

2018
- George M. Sprowls Award for Best PhD Theses in Computer Science
- Selected as Rising Star in EECS for 2018
- Outstanding Reviewer Award for CVPR 2018

2017
- UIST Conference Honorable Mention paper award

2014-2016
- Adobe Research Fellow
  - *inaugural international research fellowship given out to 10 PhD students in computer science in areas of importance to Adobe*
- SuperUROP TA Award
  - *EECS Teaching Assistant award for course: "Prep for Undergrad Research"*
- NSERC Postgraduate Scholarship – Doctoral (PGS-D)
  - *3-year doctoral scholarship*

2013
- Julie Payette NSERC Research Scholarship
  - *awarded to top 24 female Canadian graduate students for academic excellence, research ability and potential, leadership and communication skills*

2012
- Merrill Lynch Fellowship, Department of Electrical Engineering and Computer Science, MIT
- NSERC Alexander Graham Bell Canada Graduate Scholarship (CGS-M)
  - *Declined to pursue graduate studies abroad*
- Gordon Cressy Award (institutional)
  - *Extra-curricular contributions and leadership*
- Provost's Scholar Award (top 10% of graduates), Trinity College (institutional)
- Undergraduate Summer Research Award, NSERC (national)
- Dean's List for Academic Excellence *(institutional)*

2011
- Semi-finalist, Science, Engineering, and Technology Student of the Year Awards *(international)*
- Canadian Anita Borg Memorial Scholarship Finalist *(national)*
  - *Academic excellence and leadership in computer science*
- Undergraduate Summer Research Award, NSERC *(national)*
- Samuel Beatty In-Course Scholarship for Computer Science *(institutional)*

- ○ *Academic excellence in mathematical and computer science courses*
- Dean's List for Academic Excellence *(institutional)*
- Queen Elizabeth II Aiming for the Top Scholarship *(provincial)*

2010
- Undergraduate Summer Research Award, NSERC *(national)*
- Dean's List for Academic Excellence *(institutional)*
- Queen Elizabeth II Aiming for the Top Scholarship *(provincial)*

2009
- Salterrae Society Chancellor's Scholarship *(institutional)*
- University of Toronto Scholar *(institutional)*
- Computer Science Student Union Service Award for Considerable Contribution *(institutional)*
- Trinity College Entrance Scholarship *(institutional)*
- Dean's List for Academic Excellence *(institutional)*
- Queen Elizabeth II Aiming for the Top Scholarship *(provincial)*

ACADEMIC WORKSHOPS ORGANIZED

Vision and Visualization: Inspiring Novel Research Directions in Vision Science
Symposium at Vision Sciences Society, Florida   *May 18, 2018*
Co-organizer with Danielle Albers Szafir, Christine Nothelfer, Madison Elliott, and Cindy Xiong

Vision Science Meets Visualization
Panel at IEEE Information Visualization (VIS), Arizona   *Oct 4, 2017*
Co-organizer with Danielle Albers Szafir, Christine Nothelfer, Madison Elliott, and Cindy Xiong

New directions in saliency research: developments in architectures, datasets, and evaluation
Tutorial at European Conference on Computer Vision (ECCV), Amsterdam   *Oct 8, 2016*
Co-organizer with Ali Borji and Tilke Judd

PRESENTATIONS

Talks:

Computational Perception with Application to Graphic Design
Harvard Institute for Applied Computational Science   *Oct 2018*

BubbleView: an interface for crowdsourcing image importance maps and tracking visual attention
CHI conference, Montreal, Canada   *April 2018*

Learning Visual Importance for Graphic Designs and Data Visualizations
UIST conference, Quebec City, Canada   *Oct 2017*

Computational Perception of Infographics
MIT Vision Seminar   *Sept 2017*
Harvard Visual Attention Lab at Brigham & Women's Hospital   *Sept 2017*
Imager Laboratory, University of British Columbia   *Aug 2017*
INRIA, Sophia Antipolis   *July 2017*

How Studying the Perception of Visualizations is Like Studying the Perception of Scenes
Information Visualization Meet-Up, Vision Science Society, Florida   *May 2017*

Predicting Importance in Graphic Designs and Data Visualizations
    New England Computer Vision Workshop *Nov 2016*
    MIT Computer Science and Artificial Intelligence Laboratory Research Highlights *Nov 2016*

Towards Cognitive Saliency
    "New directions in saliency research" workshop at ECCV *Oct 2016*

Eye Fixation Metrics for Large Scale Analysis of Information Visualizations
    First Workshop on Eye Tracking and Visualization (ETVIS) at IEEE VIS *Oct 2015*

Computational Understanding of Image Memorability
    Affective Brain Lab, Brain and Cognitive Science Lab, MIT *Sept 2015*
    Berkeley Computer Vision Group *May 2015*
    Massachusetts Institute of Technology Graphics Group *Apr 2015*
    Boston University Image and Video Computing Group *Feb 2015*

Introduction to Computer Vision for High School
    MIT Women's Technology Program for high school girls *July 2013, July 2014*

Posters:

Computational perception for multimodal document understanding
    Rising Stars in EECS 2018 *Oct 2018*

What eye movement and memory experiments can tell us about
    the human perception of visualizations, Vision Sciences Society, Florida *May 2017*

Towards cognitive saliency: narrowing the gap to human performance
    Vision Sciences Society, Florida *May 2017*

Where should saliency models look next?
    European Conference on Computer Vision (ECCV), Amsterdam *Oct 2016*

Modeling Context Effects on Image Memorability
    IEEE CVPR Scene Understanding Workshop (SUNw), Boston *June 2015*

How you look at a picture determines if you will remember it
    IEEE CVPR Scene Understanding Workshop (SUNw), Boston *June 2015*

Quantifying Context Effects on Image Memorability
    Vision Sciences Society, Florida *May 2015*

Computational Understanding of Image Memorability
    EECS Masterworks Thesis Presentations, Boston *Apr 2015*
    CSAIL Alliance Program meeting, Boston *June 2015*

What Makes a Visualization Effective?
    CSAIL Big Data Initiative, poster session, Boston *Nov 2013*

Detecting Reduplication in Videos of American Sign Language
    8th Language Resources and Evaluation Conference (LREC), Istanbul *May 2012*

Part Learning to Support Graph-Based Object Recognition
    University of Toronto CS Undergraduate Research Showcase, Toronto *Aug 2010*

Student Outreach Events:

Hour of Code Graduate Student Panel, MIT *Dec 2015*
EECS Graduate Thesis Panel, MIT *Mar 2015*
CSAIL Researchers Panel on Computer Science for high-school [as organizer], MIT *Jan 2015*

Invited Visits:
Rising Stars in EECS *Oct 2018*
    Among "76 of the world's brightest women in EECS"
Google Student Research Summit *Sept 2017*
    Among 50 PhD students invited from across the country
Facebook's Women in Research: Lean In *March 2017*
    Among 25 female PhD students invited from across the country
Google I/O, Anita Borg Alumni Community *June 2014*
    Among 15 female PhD student leaders invited internationally

TEACHING and MENTORSHIP

Teaching Assistant:

Preparation for Undergraduate Research (6.UAR), MIT. ***Received teaching award.*** *Sept – May 2016*
Intro to Machine Learning (6.036), MIT *Jan - Apr 2015*
Introduction to Computer Programming (CSC108), UofT *Jan - April 2012*
Mathematical Expression and Reasoning for Computer Science (CSC165), UofT *Sept – Dec 2011*

Mathematics & Computer Science Tutor: [over 30 students tutored]

Qualified Tutors *June 2009 – July 2012*
Private tutoring *Dec 2008 – July 2012*
Volunteer tutoring, University of Toronto Schools *Sept 2007 – Dec 2008*

Mentorship:

Master of Engineering Theses
- Nathan Landman (Fall 2017 – ongoing)
- Kimberli Zhong (Fall 2017 – ongoing)
- Spandan Madan (Spring 2017-2018), Harvard Thesis: "Automated parsing and understanding of infographics"
- Sami Alsheikh (Spring 2017), MIT Thesis: "Automated understanding of data visualizations"
- Tony Zhao (Spring 2015), MIT Thesis: "Modeling image-to-image confusions in memory"

Student Researchers
- Matthew Tancik (Summer 2017 – ongoing)

MIT Undergraduate Research Opportunity Program (UROP)
- Anelise Newman (Fall 2017 - ongoing), Kimberli Zhong (Spring 2017), John Brown (Fall 2015 – Spring 2016), Alice Wu (Fall 2015), Tony Zhao (Fall 2014 – Spring 2015), Temuge Enkhbaatar (Fall 2013 – Spring 2014), Katharine Xiao (Fall 2013 – Spring 2014)

6.MITx Summer Program
- Carolyn Chang, Danny Sanchez (Summer 2013), Video Annotation Tool

SERVICE and LEADERSHIP

Technical paper reviews:

CVPR (18', 17', 16', 15'); ECCV ('18, '16); InfoVis ('18); UIST ('18); ACM CHI ('18, '17); Eurographics ('18, '15); Cognition ('18); ICCV ('17); SIGGRAPH ('17); Computer Vision and Image Understanding ('17); EEE Virtual Reality ('17); International Journal of Computer Vision ('18, '16); Vision Research ('14); Pattern Recognition Letters ('14); Journal of Vision ('15); Eurovision ('16); IEEE Trans. on Pattern Analysis and Machine Intelligence ('18, '17, '16); IEEE Trans. on Computational Imaging ('16); IEEE Trans. on Neural Networks and Learning Systems ('16, '15); IEEE Trans. on Image Processing ('18, '17, '16, '15); IEEE Trans. on Cybernetics ('17, '16, '15); IEEE Trans. on Multimedia ('16); IEEE Trans. on Circuits and Systems for Video Technology ('17)

Outstanding Reviewer for CVPR '18.

Student groups and organizations:

Member, MIT Committee on Graduate Programs   *Sept 2015 – May 2017*
- Responsible for evaluating proposals for the adoption of new graduate degree programs and educational programs, as well as graduate student policies
- One of two graduate students selected to sit on committee; asked to stay on for second term

Member, MIT EECS Visiting Committee graduate student group   *Nov – Apr 2016*
- Report to EECS visiting committee about departmental initiatives and areas for improvement

Intern Mentor, Adobe Girls Who Code Summer Program   *June – Aug 2016*
- Weekly mentorship lunches

Member, MIT Faculty Policy Committee, subcommittee on modular subjects   *Oct 2015 – Apr 2016*
- Monthly meetings to discuss and draft assessment report about sub-term subjects, proposing possible additions or changes to Faculty Rules and Regulations
- Only graduate student representative selected to sit on committee

Member, Google Anita Borg Alumni Planning Committee   *July 2014 – July 2015*
- Goal: outreach to improve representation of females in computing
- One of 15 females selected globally to manage committee initiatives
- Regular organizational and event planning meetings

Member, MIT Graduate Student Life Grants Funding Panel   *Nov 2014, Nov 2015*
- Responsible for reviewing 30-40 funding proposals
- Serving on a panel to discuss funding proposals

Co-organizer, MIT Computer Vision Lunch Seminar   *Jan 2014 – Sept 2015*
- Coordinating speakers for weekly seminars

Co-founder, SciEx Science Communication Initiative   *Dec 2013 – May 2015*
- yearly student video competition for short videos about extreme science and engineering, aimed at K-12 (http://sciex.mit.edu)
- yearly networking events for students across colleges in Boston
- yearly film showing as part of the Cambridge Science Festival

Member, Digital Learning Subcommittee, MIT Graduate Student Council   *Apr – Nov 2013*
- Meetings throughout the year to discuss issues pertinent to online education
- Graduate student participation in the MIT Task Force on Future of Education
- Reports, surveys, and advice passed on to MIT administration

Organizer, Undergraduate Artificial Intelligence Day   *Sept 2011*
- Faculty presentations, research dissemination
- Event to acquaint undergraduates with courses and research in A.I. fields at U of T

Founder and President, U of T Undergraduate Artificial Intelligence Group   *Oct 2010 – May 2012*
- Weekly meetings to discuss papers and research
- Invited talks by graduate students and faculty in A.I. fields

Previous roles:
- Public Relations Officer, U of T Computer Science Student Union   *May 2009 – May 2010*
- Event coordinator, U of T Russian Student Association Executive   *May 2009 – May 2010*