Mikhail Bessmeltsev

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My research interests are in computer graphics/vision area, including, but not limited to: sketch-based modeling, character animation, and geometry processing. For a few last years I focused on recovering 3D shape from 2D sketches.

Professional Experience

2016 – Now **Postdoctoral Associate (Computer Graphics)** *– Massachusetts Institute of Technology,* Cambridge, MA. Advisor: Dr. Justin Solomon

Activities:

- 2 papers under development on sketch-based modeling/machine learning
- Writing grant proposals
- Co-advised a high-school student working on an Optimal Transport problem

Topics related to the research:

- Vector/Polyvector fields
- Differential geometry
- Large-scale numerical optimization
- Optical flow
- Deep Learning

2010 – 2016 **Ph.D. in Computer Science (Computer Graphics)** *– University of British Columbia,* Vancouver, Canada, Supervisor: Dr. Alla Sheffer

Thesis title: **Recovering 3D Shape from Concept and Pose Drawings**

Activities:

- Developing novel algorithms in 3D modeling
- Prototyping new methods in C++ and Matlab
    - Geometry processing and generation tasks
    - Numerical optimization problems
    - Character rigging, skinning, and animation algorithms
- Writing and publishing papers
    - CAD and Human/character modeling
    - Character articulation
- Reading and implementing research papers in computer graphics & computer vision
- Designing and conducting user studies

2015 Scientific Consultant *– Digital Animal Interactive, Inc.,* Vancouver, Canada

Product website: http://ftsy.co/, supervisor: Ryan Smith

- Consulting on various Computer Vision problems - 3D scanning and reconstruction

Selected Publications

Vectorization of Line Drawings via PolyVector Fields by **Mikhail Bessmeltsev** and Justin Solomon, pre-print:
https://arxiv.org/abs/1801.01922

Isometry-Aware Preconditioning for Mesh Parameterization by Sebastian Claici, **Mikhail Bessmeltsev**, Scott Schaefer, and Justin Solomon. SGP 2017, London.

Gesture3D: Posing 3D Characters via Gesture Drawings by **Mikhail Bessmeltsev**, Nicholas Vining, Alla Sheffer. ACM Trans. Graph. 35, 6, Article 165, November 2016

Recovering 3D Shape from Concept and Pose Drawings by **Mikhail Bessmeltsev**, Ph.D. thesis, 2016.

Modeling Character Canvases from Cartoon Drawings by **Mikhail Bessmeltsev**, Will Chang, Nicholas Vining, Alla Sheffer, Karan Singh, ACM Transactions on Graphics, Volume 34, Issue 5, Oct 2015

Design-Driven Quadrangulation of Closed 3D Curves by **Mikhail Bessmeltsev**, Caoyu Wang, Alla Sheffer, Karan Singh, ACM Transactions on Graphics (SIGGRAPH ASIA 2012), Volume 31, Issue 5, December 2012 (Acceptance rate: 24%)

Digital Micrography by Ron Maharik, **Mikhail Bessmeltsev**, Alla Sheffer, Ariel Shamir and Nathan Carr, ACM Transactions on Graphics (Proc. SIGGRAPH 2011), Volume 30, Number 4, July 2011 (Acceptance rate: 19%)

Education

2010 – **2016**	**Ph.D. in Computer Science –** *University of British Columbia*
	Completed graduate-level courses on machine learning, computer graphics, computer animation, computational geometry, numerical optimization, and others.
2008 – 2010	**M.Sc. in Applied Mathematics and Informatics –** *Novosibirsk State University*
	Mechanics and Mathematics Department Novosibirsk, Russia **(GPA: 4.82/5.0),** Supervisor: Olga Nechaeva
	Thesis title: Generating moving meshes using Kohonen's Self Organizing Maps
2004 – 2008	**B.Sc. in Applied Mathematics and Informatics –** *Novosibirsk State University* Mechanics and Mathematics Department, Novosibirsk, Russia **(GPA: 4.78/5.0),** Supervisor: O. Nechaeva

Awards

2015	(Nominated) **UBC Killiam TA award**	Computer Science department nomination
2013	**Graduate TA award**	*UBC Computer Science award for excellence in teaching*
2010	**Best business plan**	for CatchACloud, a laser scan processing software at *Provincial contest of business plans.*
2007	**Intel Scholarship**	One of ~ten recipients across Russia
2007	**Excellence in studying**	*Novosibirsk State University*
2006	**Intel Scholarship**	One of ~ten recipients across Russia

Additional Work Experience

AISoftPro, LLC	**Full-time position**
Chief Technology Officer (CTO), co-founder	**April 2009 – September 2010**

- ✓ Making executive-level decisions
- ✓ Presenting the project to potential investors
- ✓ Leading development of laser scan processing software

Virartech, LLC	**Part-time position**

Project Manager   **December 2008 – March 2009**
- ✓ Managing development of music-related software
- ✓ Teaching in-company courses on Object-Oriented Architecture and Design

GoKillTime, LLC   **Part-time position**
Software Developer   **July – December 2008**
- ✓ Game development for mobile platforms (iPhone, Android)

Relevant Activities

Intel-NSU High-Performance Systems Lab
Team Leader of Geometry Processing Group   **2008 – 2010**
- ✓ Supervising research of ten undergraduate and graduate students
- ✓ Managing the development of all the research software

Intel-NSU High-Performance Computing School
School Coordinator   **Winter 2010**
- ✓ Supervision of project leaders
- ✓ Assisting leaders and their teams with programming, team management

Intel-NSU High-Performance Computing School
Project Leader of Monte-Carlo traffic simulator   **Winter 2009**
- ✓ Project management