Dmitrii Marin

Curriculum Vitae

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I am a PhD candidate in Computer Science in the field of computer vision. I also have experience in software development including designing and implementing complex algorithms and data structures. I gained knowledge in mathematically intensive scientific programming, infrastructure and back-end programming.

Education and Research

2015 – present **PhD candidate**, *Department of Computer Science, University of Western Ontario*, London, ON, Canada, `http://publish.uwo.ca/~dmarin3/`.
Supervisor Prof. Yuri Boykov.
My research is focused on designing general unsupervised and semi-supervised methods for accurate image segmentation and object delineation. In particular, I am focused on segmentation/detection of thin objects of different nature, e.g. roads, blood vessels, or contrast edges. The problem is formulated as cost function minimization. The concrete choice of the function depends on the properties of objects of interest. Many useful formulations are NP-hard, therefore efficient approximate optimization algorithms for such functions are desired.
An interesting spin-off of combining kernel clustering with regularization (MRF) later became a separate project, which resulted in theoretical explanation of few long-observed biases in kernel clustering.

Oct 2016 – Feb 2017 **Research Intern**, *Oculus Research (Facebook)*, Pittsburgh, PA, USA, `https://www.oculus.com/research/`.
Supervisors Dr. Chenglei Wu and Prof. Yaser Sheikh. I focused on detection and multi-view 3D reconstruction of thin objects.

Feb – May 2014 **Visiting Researcher**, *Department of Computer Science, University of Western Ontario*, London, ON, Canada, `http://vision.csd.uwo.ca`.
Supervisor Prof. Yuri Boykov. I focused on formulating a segmentation problem that takes into account the integral curvature of the object's boundary. I tried different optimization techniques including graph cuts, move making strategies and trust region approach. I continued my work later as a PhD student at UWO.

2011–2013 **M.Sc. diploma with honours**, *Department of Applied Mathematics and Information Science, The National Research University Higher School of Economics*, Moscow, Russia, `http://www.hse.ru/en/`.
GPA – 9.5 (max is 10). Supervisors Prof. Victor Lempitsky & Prof. Mikhail Roytberg. We worked on approaches to the problem of tree-like objects extraction, e.g. neurons or blood vessels. We explored different Steiner problem formulations and used efficient approximate solvers to improve the extraction quality.

2006–2011 **M.Sc. & B.Sc. in software engineering with honours**, *Department of informatics and robotics, Ufa State Aviation Technical University*, Ufa, Russia, `http://www.ugatu.ac.ru/en.html`.
GPA – 5 (max is 5). Supervisor prof. Yuri Orechov. In my thesis I focused on applying machine learning techniques to well logging data for detection of reservoirs, porus rocks that are able to capture crude oil and natural gas.

Publications

2017 **D. Marin, M. Tang, I.B. Ayed, Y. Boykov**, *Kernel clustering: density biases and solutions.*, TPAMI (in review).
https://arxiv.org/abs/1705.05950

2016 **M. Tang, D. Marin, I.B. Ayed, Y. Boykov**, *Normalized Cut meets MRF*, European Conference on Computer Vision (ECCV), Amsterdam, Netherlands, October 2016.
Conference paper: http://goo.gl/18Hw34 **(oral)**

2015 **D. Marin, Y. Zhong, M. Drangova, Y. Boykov**, *Thin Structure Estimation with Curvature Regularization*, International Conference on Computer Vision (ICCV), Santiago, Chili, December 2015.
Conference paper: http://goo.gl/wbiyvw
Acceptance rate 19.62%.

2015 **M. Tang, I. B. Ayed, D. Marin, Y. Boykov**, *Secrets of GrabCut and Kernel K-means*, International Conference on Computer Vision (ICCV), Santiago, Chili, December 2015.
Conference paper: http://goo.gl/KiOJe9
Technical report (extended version): arXiv:1506.07439
Acceptance rate 19.62%.

Certificates

2011–2013 **School of Data Analysis**, Moscow, `https://yandexdataschool.com/`.
A Master's-level program in Computer Science and Data Analysis offered by Yandex, Russia's largest search engine company. GPA – 5 (max is 5). Completed 15 courses on data analysis including Algorithm and Data Structures, Recovery of Functional Laws from Empirical Evidence, Fundamentals of Stochastics & Stochastic Models, Parallel and Distributed Computation, Machine Learning, Image and Video Analysis, Graphical Models, Bayesian Machine Learning Models, Introduction to Linguistics & Machine Translation.

Technology Summary

Programming languages C/C++ (7+ years), Matlab (4+ years), Python (4+ years), shell

Technologies NumPy/SciPy, SKLearn, GPU (CUDA for C/C++), Map-Reduce, Unix command line tools

Research Interests	Machine Learning, Computer Vision

Work experience

2013 – 2014   **Software developer at LLC Yandex IT company**, Russia's Largest search engine, Moscow, `https://company.yandex.com/`.
Technologies: C/C++, Python, Map-Reduce, Linux
Responsibilities:
- I developed and supported software for
  - extraction of people's names from web pages and search queries,
  - morphological disambiguation of extracted names,
  - effective storage of them in a search index.
- I developed and supported software for construction of a knowledge base:
  - raw data validation and
  - relationship prediction.

2011   **Software developer at LLC Geotec**, Ufa, `http://www.primegeo.ru`.
I developed and supported a general machine learning module for *Prime*, well logging data analysis software (used in oil production industry).
Clients: Rosneft, Lukoil, Belorusneft, Bashneft, Tatneft, etc.

2010   **Summer Intern at LLC Yandex**, Moscow.
I worked on implementation of OpenLR standard for Yandex.Maps

2007 – 2009   **User support and network technician**, *Municipal Environmental Educational Center*, Ufa.
Software and hardware support. Website development and support.

Awards

Scholarships

2015   **Western Graduate Research Scholarship**, *University of Western Ontario*.

2012   **Scholarship of the Government of Moscow**.

2010   **Scholarship of the Government of Russian Federation**.

2009   **Scholarship of the President of Republic of Bashkortostan**.

Competition Results

I have taken part in algorithmic competitions like Google Code Jam, TopCoder, ACM International Collegiate Programming Contest (ICPC)

2010   **Annual ACM ICPC World Finals**, *Harbin, China*, World 36th position.

2009   **All-Russian Collegiate Programming Contest / ACM ICPC 2009-2010, North-Eastern European Regional Contest**, *Saint-Petersburg*, Second Degree Certificate of Achievement.

2009   **ACM ICPC 2009-2010, NEERC, Eastern Subregional Contest**, *Yekaterinburg*, Second Degree Certificate of Achievement.

2008 **ACM ICPC 2008-2009, NEERC, Eastern Subregional Contest**,
Yekaterinburg, Third Degree Certificate of Achievement.

2007 **ACM ICPC 2007-2008, NEERC, Eastern Subregional Contest**,
Yekaterinburg, Third Degree Certificate of Achievement.

Community services

I have reviewed paper submissions for:
- European Conference on Computer Vision (ECCV) 2016
- International Conference on Computer Vision (ICCV) 2015, 2017
- Conference on Computer Vision and Pattern Recognition (CVPR) 2015, 2016, 2017
- International Journal of Computer Vision (IJCV) 2015

I have served as a member of the scholarship and mobilization committees, a member of the bargaining team of PSAC Local 610, a teaching assistants and postdocs union at UWO, and chaired the graduate student issues committee of the society of graduate students at UWO.