Daniyar TURMUKHAMBETOV

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Current Position

Senior Research Scientist Jun. 2018 -
Niantic Inc - Matrix Mill Ltd London, UK

Area: Computer Vision and Machine Learning

Publications

Interpretable Transformations with Encoder-Decoder Networks
Daniel E. Worrall, Stephan J. Garbin, Daniyar Turmukhambetov, Gabriel J. Brostow
In Proceedings of The IEEE International Conference on Computer Vision (ICCV), 2017

Harmonic Networks: Deep Translation and Rotation Equivariance
Daniel E. Worrall, Stephan J. Garbin, Daniyar Turmukhambetov, Gabriel J. Brostow
In Proceedings of The IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2017

Help, It Looks Confusing: GUI Task Automation Through Demonstration and Follow-up Questions
Thanapong Intharah, Daniyar Turmukhambetov, Gabriel J. Brostow
In Proceedings of ACM Intelligent User Interfaces (IUI) , 2017

Modeling Object Appearance using Context-Conditioned Component Analysis
Daniyar Turmukhambetov, Neill D.F. Campbell, Simon J.D. Prince, Jan Kautz
In Proceedings of The IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2015

Interactive Sketch-Driven Image Synthesis
Daniyar Turmukhambetov, Neill D.F. Campbell, Dan B Goldman, Jan Kautz
Computer Graphics Forum, 2015

Past Work Experience

Post-doctoral Research Associate Jan. 2016 - Nov. 2017
University College London London, UK

Area: Computer Vision and Machine Learning

Research Projects:

FuSe - Technologies For Bioacoustic Sensing: NERC-funded project for national bat monitoring program that analyze bat species trends from nation-wide ultra-sound recordings captured on AudioMoth devices. I was responsible for developing and deploying machine learning algorithms that process terabytes of ultra-sound recordings on the cloud. I also co-advised and worked with two PhD students on novel techniques for improving 2D and 3D rotation invariance and equivariance of convolutional neural networks.

Nature-Smart Cities - Sensing Nature in the Queen Elizabeth Olympic Park (naturesmartcities.com): EPSRC Impact project that develops automatic bat monitoring for conservation using ultra-sound recordings of bats and machine learning algorithms for bat call detection and species classification on embedded devices. I was responsible for optimizing and porting convolutional neural networks to Intel Edison low-power devices, so that the machine learning algorithms could run on the devices. I successfully reduced processing time of a typical 3 second ultra-sound recording from 40 seconds to 6 seconds.

Capture-Reconstruct-Play: Funded by EU-FP7, investigates and develops novel computer vision and computer graphics techniques for videogames development. I developed novel Variational Autoencoder architectures for the task of image synthesis and video textures. I also co-advised and worked with two PhD students on two projects: one on motion models for 2D and 3D tracking and another on interactive GUI task automation through analysis of user's demonstration.

Research Intern   2012
Adobe   Seattle, WA, USA
Worked with Dr. Dan B Goldman at Creative Technologies Lab. The research was on interactive system that assists users in drawing and painting photorealistic images of objects with real-time feedback. I also collected a dataset of images and developed GUI tools for labeling images.

Lab Demonstrator   2011 - 2012
University College London   London, UK
Lab demonstrator for "Mathematical Models, Algorithmics and Implementations" and "Machine Vision" MSc-level courses.

Teacher   2009 - 2010
International IT University   Almaty, Kazakhstan
Developed and implemented weekly laboratory assignments for "Algorithms and Programming Languages" course, administered exams and analysed student performance.

Taught laboratory classes for 4 groups. Tutored 1 group.

As part of high school students outreach program, taught "Introduction to IT" to 3 groups of high school students during summer. The course was mainly about programming in Java and developing simple games using "Greenfoot" framework.

Software Developer   2010
NITEC laboratory at International IT University   Almaty, Kazakhstan
Developer on laboratory team responsible for eAkimat project assigned by National Information Technologies organization (NITEC). eAkimat is a web portal for state and local government representatives to allow citizens to use services provided by local government through internet.

Duties included developing services for eAkimat using C#(ASP.NET), Javascript(Coolite+ExtJs), MS SQL Server, NHibernate.

Education

PhD in Computer Science
University College London

2011 - 2016
London, UK

PhD Thesis: "Synthesizing and Editing Photo-realistic Visual Objects"

Supervisors: Prof. Jan Kautz and Dr. Simon J.D. Prince.

Collaborators: Dr. Neill D.F. Campbell and Dr. Dan B Goldman

Area: Computer Vision and Computer Graphics.

Studentships from EPSRC and Faculty of Engineering of University College London.

MSc in Computer Graphics, Vision and Imaging
University College London

2010 - 2011
London, UK

Master's Thesis: "Intrinsic Images from Color and Depth" supervised by Dr. Gabriel J. Brostow. The thesis focuses on decomposition of images into reflectance, shading and shadows using RGB and depth images as input.

Graduated with Distinction. The thesis won "BBC Best Project Prize".

B.Eng. in Computer Science and Technology
Tsinghua University

2005 - 2009
Beijing, China

Bachelor's Thesis: "Depth Estimation from Multi-view Video"

Language of Instruction: Mandarin Chinese.

Chinese Language Course
Beijing Foreign Studies University

2004 - 2005
Beijing, China

HSK Level: 6

Honors and Awards

2011-2015 UCL Faculty of Engineering Postgraduate Research Scholarship.

2011-2015 EPSRC Studentship.

2011 "BBC Best Project Prize" for the MSc Thesis.

2004–2009 "Chinese National Petroleum Corporation" Scholarship.

2004 "Altyn Belgi" honours award

2003 Third degree award in Republic Science Projects Competition among High School Students in Mathematics. (Also, third degree award in Almaty Science Projects Competition among High School Students in Mathematics)

2003 Participant of Republic High School Students Olympiad in Mathematics. (Also, First degree award in Almaty High School Students Olympiad in Mathematics.)

2002 Participant of Republic High School Students Olympiad in Mathematics. (Also, First degree award in Almaty High School Students Olympiad in Mathematics.)

Skills

Computer Vision: Intrinsic image decomposition, Interactive sketching, 3D Geometry,

Machine Learning: Deep Learning, Convolutional Neural Networks, Variational Autoencoders, Probabilistic Linear Models, Random Forests, Gaussian Processes, Neural networks on embedded devices, Conditional Random Fields

Programming Languages, Libraries and Frameworks: Python (numpy, scipy, tensorflow, flask, mongoengine), Matlab (Octave), C/C++ (Qt, CUDA), LaTeX

Languages: English(fluent), Kazakh(native), Russian(native), Mandarin Chinese(proficient), Turkish(proficient)

References

Dr. Gabriel J. Brostow
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University College London, London, UK
E-mail: g.brostow (at) cs.ucl.ac.uk

Prof. Jan Kautz
Mobile Visual Computing Research
NVIDIA, Boston, MA, USA
E-mail: j.kautz (at) ucl.ac.uk

Dr. Neill D.F. Campbell
Department of Computer Science
University of Bath, Bath, UK
E-mail: n.campbell (at) bath.ac.uk

Dr. Simon J.D. Prince
Anthropics Technology, London, UK
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