Sergey Tulyakov

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Summary

Specializes in 2D and 3D computer vision, machine learning, generative and discriminative modeling, digital signal processing. Has extensive background in software engineering.

Current research interests: Discriminative and generative modeling, image and video generation, face alignment, tracking, head pose estimation in 2D and 3D, higher-level activity recognition such as facial expressions, heart rate recognition from video, with particular emphasis on facial analysis in difficult realistic scenarios.

Technical skills: C++, Python, C#, Qt, Boost, CMake, Shell, Unix, Windows, macOS
Scientific computing: Eigen, dlib, OpenCV, PointCloudLibrary(PCL), scientific python stack, Theano, Chainer, Matlab

Education

Oct 2012 – Apr 2017	University of Trento (Trento, Italy) **PhD in Computer Science.** Thesis: A Computer Vision Perspective on Face Analysis: Registration, Tracking, Synthesis
Nov 2014 – Feb 2015	Carnegie Mellon University (Pittsburgh, USA) **Research intern** at Robotics Institute
Sept 2009 – July 2010	Belarusian State University of Informatics and Radioelectronics (Minsk, Belarus) Master in Computer Science. **Final grade: 9 out of 10**
Sept 2004 – July 2009	Belarusian State University of Informatics and Radioelectronics (Minsk, Belarus) Bachelor in Computer Science. **Diploma with distinction. GPA 8.9. Final grade: 10 out of 10**

Scientific projects

- The **ACANTO** project aims at increasing the number of older adults who engage in a regular and sustained physical activity. Developed a real-time method for instantaneous heart rate recognition from face videos.
- The **DALi - Devices for Assisted Living** project aimed at extending autonomous live of elderly people beyond home. Developed a real-time system for head pose analysis, tracking and facial expression recognition under a wide range of head poses.
- The purpose of the **PerTe - Persuasive Technology** project was to aid groups of people in a brainstorming environment. Worked on user monitoring part: track faces, measure attention given/received and analyze speech activity of the subjects.

Personal projects

- **Facify** is a face tracking and 3D face reconstruction technology, enabling real-time face analysis on low-power mobile devices. The technology features a tiny hard drive footprint (20mb) and impressive tracking speed (200 frames per second on iPhone 6)
- **FaceCept - Face perCept** is a technology that allows real-time analysis of people's faces. Key features: gender, age, facial expression, new/returning, attention time recognition. The technology is cross-platform: it runs even in a browser.
- **FaceCept3D** is a flexible **open-source** technology for 3D face analysis and recognition, available on GitHub. Key features: head pose, facial expression and action units recognition in real time. FaceCept3D handles head pose ranges much wider than other systems.

Work experience

01/2017 – 04/2017	Research intern at NVIDIA (Santa Clara, CA, US) Worked on motion-content decomposed video generation using Generative Adversarial Networks with Ming-Yu Liu and Jan Kautz.
08/2016 – 11/2016	Research intern at Microsoft Research (Cambridge, UK) Together with Sebastian Nowozin and Andrew Fitzgibbon worked on building efficient hybrids of deep generative and discriminative models, that benefit from using unlabeled data.
07/2010 – 09/2012	Senior software engineer, project lead at HiQo Solutions, Inc (Minsk, Belarus)
06/2006 – 06/2010	Software engineer at Todes, Ltd. (Minsk, Belarus)

Professional activities

Events:	Chair of the first Workshop on 3D Face Alignment in the Wild (3DFAW) & Challenge organized in conjunction with ECCV 2016.
Reviewer:	International Conference on Computer Vision 2017 Computer Vision and Pattern Recognition 2017 International Conference on Face and Gesture Recognition 2017 European Conference on Computer Vision 2016 International Conference on Pattern Recognition 2016 IEEE Transactions on Affective Computing IEEE Transactions on Multimedia Elsevier Image and Vision Computing

Publications and patents

[1] S. Tulyakov, M.-Y. Liu, X. Yang, and J. Kautz. *MoCoGAN: Decomposing Motion and Content for Video Generation*. Submitted to International Conference on Computer Vision, 2017.

[2] S. Tulyakov, A. Fitzgibbon, and S. Nowozin *Hybrid-VAE: Improving Deep Generative Models using Partial Observations*. Submitted to International Conference on Computer Vision, 2017.

[3] László A. Jeni, Sergey Tulyakov, Lijun Yin, Nicu Sebe, and Jeffrey F. Cohn *The First 3D Face Alignment in the Wild (3DFAW) Challenge*. European Conference on Computer Vision, 2016.

[4] **[Oral]** W. Wang, S. Tulyakov, N. Sebe. *Recurrent Convolutional Face Alignment*. Asian Conference on Computer Vision, 2016.

[5] S. Tulyakov, L. A. Jeni, N. Sebe, and J. Cohn. *Viewpoint-consistent 3D Face Alignment*. Submitted to Pattern Analysis and Machine Intelligence.

[6] **[Oral]** S. Tulyakov, X. Alameda-Pineda, E. Ricci, L. Yin, N. Sebe, and J. Cohn. *Self-Adaptive Matrix Completion for Heart Rate Estimation from Face Videos under Realistic Conditions*. Computer Vision and Pattern Recognition, 2016.

[7] S. Tulyakov and N. Sebe. *Regressing a 3D Face Shape from a Single Image*. In International Conference on Computer Vision, 2015.

[8] S. Tulyakov, R. L. Vieriu, E. Sangineto and N. Sebe. *FaceCept3D: Real Time 3D Face Tracking and Analysis*. In International Conference on Computer Vision Workshops, 2015.

[9] R. L. Vieriu, S. Tulyakov, E. Sangineto, S. Semeniuta, and N. Sebe. *Facial Expression Recognition under a Wide Range of Head Poses*. In Face and Gesture Recognition, 2015.

[10] S. Tulyakov, R. L. Vieriu, S. Semeniuta, and N. Sebe. *Robust Real-Time Extreme Head Pose Estimation*. In International Conference on Pattern Recognition, 2014.

[11] **[Patent]** S. Tulyakov, M-Y. Liu, X. Yang, and J. Kautz. *Method for content and motion controlled action video generation*. Patent Application No: 62/354,475.

[12] **[Patent]** S. Tulyakov, X. Alameda-Pineda, E. Ricci, L. Yin, N. Sebe, and J. Cohn. *Self-Adaptive Matrix Completion for Heart Rate Estimation from Face Videos under Realistic Conditions*. Patent Application No: 62/480,094.