CURRICULUM VITAE

PERSONAL INFORMATION

Name	TOLGA BIRDAL, M.Sc.
Address	Georgenschwaigstrasse 11 80807, Muenchen, Deutschland
Telephone	+49–176 80898287
E-Mail	tolga.birdal@tum.de tbirdal@gmail.com
Nationality	Turkish
Date of birth	17.12.1983
Webpage	http:/tbirdal.me , https://linkedin.com/in/tbirdal , http://campar.in.tum.de/Main/TolgaBirdal
Interests	3D Computer Vision, Machine Learning, Machine Vision, Pattern Recognition, High Performance Computing

EDUCATION

▷ Period	2014–Defended on 2018
○ Acquired qualifications	**Dr. Rer. Nat. (Ph.D.) (Expected)**
○ Institute	Technical University of Munich
○ Principal subjects	Informatics
○ Thesis subject	Geometric Methods for 3D Reconstruction from Large Point Clouds
▷ Period	2008–2011
○ Acquired qualifications	**Master of Science**
○ Institute	Technical University of Munich
○ Principal subjects	Computational Science and Engineering
○ Thesis subject	3D Deformable Surface Recovery Using RGBD Cameras
▷ Period	2004–2008
○ Acquired qualifications	**Bachelor of Science**
○ Institute	Sabanci University
○ Principal subjects	Electronics Engineering
▷ Period	1999–2004
○ Graduate school	Robert College
○ Principal subjects	Science

PROFESSION

▷ Period	2014–Present
○ Employer	**Siemens Corporate Technology** Otto Hahn Ring 6, 81739, Muenchen, Deutchland
○ Position	Research Scientist

◦ Projects	I have started to contribute in Siemens' machine vision research as a byproduct of my Doctoral studies on large scale 3d reconstruction, where the presence of clutter and occlusion is inevitable. We expect our research to impact Autonomous Systems and Quality Assurance.
▷ Period	2014–2014
◦ Employer	**Google Summer of Code** Mountain View, CA, USA
◦ Position	Student
◦ Supervisor	Dr. Vincent Rabaud
◦ Projects	Implementation of surface matching algorithms into OpenCV
▷ Period	2010–2014
◦ Employer	**Gravi Information Technologies** Istanbul, Turkey
◦ Position	CEO & Co-Founder
◦ Projects	Gravi is a research oriented machine vision company in Turkey, developing industry oriented vision libraries. I was responsible in the management and the direction of the research on 3D machine vision.
▷ Period	2008–2011
◦ Employer	**BeFunky Inc.** San Francisco, CA, USA
◦ Position	Chief Engineer & Co-Founder
◦ Projects	I have co-founded BeFunky, an online digital art engine, which utilizes state of the art computer vision algorithms. Besides being the co-founder I have developed the entire system and most of the basis for the algorithms running on BeFunky (www.befunky.com)
▷ Period	2009–2010
◦ Employer	**Mitsubishi Electric Research Labs** Cambridge, MA, USA
◦ Position	Intern
◦ Supervisor	Prof. Fatih Porikli
◦ Projects	At MERL, I worked on simulating human breathing in 4D. This included the implementation of Random Walks for image segmentation, 3D CT processing on CUDA, and real-time Bilateral Filtering.
▷ Period	2007
◦ Employer	**Carnegie Mellon University** Pittsburgh, PA, USA
◦ Position	Intern
◦ Supervisor	Prof. Martial Hebert & Dr. Yan. Ke
◦ Project	Shape Matching Algorithm using Spatial Segmentation Data
▷ Period	2005–2007
◦ Employer	**Vistek Isra Vision** Teknokent, Gebze, Turkey
◦ Position	Application Developer
◦ Supervisor	Prof. Aytul Ercil
◦ Projects	Development of industrial computer vision systems on OCR/OCV, Barcode Reading, Robot Control, Object Classification based on Halcon.

PUBLICATIONS

▷ International Conferences

Tolga Birdal & Umut Simsekli: *Probabilistic Permutation Synchronization using the Riemannian Structure of the Birkhoff Polytope*, Under Review, CVPR 2019

Haowen Deng, **Tolga Birdal** & Slobodan Ilic: *3D Local Features for Direct Pairwise Registration*, Under Review, CVPR 2019

Tolga Birdal, Umut Simsekli, Onur Eken & Slobodan Ilic: *Bayesian Pose Graph Optimization via Bingham Distributions and Tempered Geodesic MCMC*, NIPS 2018, Montréal, Quebec

Yongheng Zhang, **Tolga Birdal**, Haowen Deng & Federico Tombari: *3D Point-Capsule Networks*, 2018, (Under Review, CVPR 2019)
`https://arxiv.org/abs/1812.10775`

Haowen Deng, **Tolga Birdal** & Slobodan Ilic: *PPF-FoldNet: Unsupervised Learning of Rotation Invariant 3D Local Descriptors*, ECCV 2018, Munich

Adrian Haarbach, **Tolga Birdal** & Slobodan Ilic: *Survey of Higher Order Rigid Body Motion Interpolation Methods for Keyframe Animation and Continuous-Time Trajectory Estimation*, 3DV 2018, Verona

Tolga Birdal, Benjamin Busam, Nassir Navab, Slobodan Ilic & Peter Sturm: *A Minimalist Approach to Type-Agnostic Detection of Quadrics in Point Clouds*, CVPR 2018, Salt Lake City

Haowen Deng, **Tolga Birdal** & Slobodan Ilic: *PPFNet: Global Context Aware Local Features for Robust 3D Point Matching* CVPR 2018 (Spotlight), Salt Lake City

Tolga Birdal & Slobodan Ilic: *CAD Priors for Accurate and Flexible 3D Reconstruction*, ICCV 2017, Venice

Benjamin Busam, **Tolga Birdal** & Nassir Navab: *Camera Pose Filtering with Local Regression Geodesics on the Riemannian Manifold of Dual Quaternions*, ICCVW 2017, Venice

Tolga Birdal & Slobodan Ilic: *A Point Sampling Algorithm for 3D Matching of Irregular Geometries*, IROS 2017, Vancouver

Tolga Birdal, Ievgeniia Dobryden & Slobodan Ilic: *X-Tag: A Fiducial Tag for Flexible and Accurate Bundle Adjustment*, 3DV 2016, Stanford University

Tolga Birdal, Emrah Bala, Tolga Eren & Slobodan Ilic: *Online Inspection of 3D Parts via a Locally Overlapping Camera Network*, WACV 2016, Lake Placid

Tolga Birdal & Slobodan Ilic: *Point Pair Features Based Object Detection and Pose Estimation Revisited*, 3DV 2015 (Oral presentation), Lyon

Umut Simsekli & **Tolga Birdal**: *A Unified Probabilistic Framework For Robust Decoding Of Linear Barcodes*, ICASSP 2015, Brisbane

Tolga Birdal, Diana Mateus & Slobodan Ilic: *Towards A Complete Framework For Deformable Surface Recovery Using RGBD Cameras*, IROS 2012, Vilamoura/Portugal

Tolga Birdal & Aytul Ercil: *Real-time Automated Road, Lane and Car Detection for Autonomous Driving*, DSPincars, 2007, Istanbul

▷ National Conferences

Tolga Birdal & Slobodan Ilic: *Task Oriented 3D Sampling via Genetic Algorithms*, SIU 2018, Izmir, Turkey

Umut Simsekli, **Tolga Birdal**, Emre Koc & Taylan Cemgil: *A Factorization Based Recommender System for Online Services*, SIU 2013, Cyprus

▷ Patents

Tolga Birdal: *Computer-aided image processing method*, WO2018137935A1.

Tolga Birdal, Ievgeniia Dobryden & Slobodan Ilic: *Marking Device*, DE102016221279A1.

Tolga Birdal, Mehmet Ozkanoglu & Abdi Tekin Tatar: *Method and System for Generating Online Cartoon Outputs* US8629883B2.

Tolga Birdal, Emrah Bala, Emre Koc, Mehmet Ozkanoglu & Abdi Tekin Tatar: *Method and System for Providing an Image Effects Interface* US9483237B2.

CONFERENCES

▷ Academic conferences

CVPR (2017, 2018), ICCV 2017, IROS (2017, 2012), 3DV (2015, 2016), WACV 2016, SIU (2017, 2013, 2008, 2006), DSPInCars 2007

▷ Summer schools

2013, IPAM Computer Vision Graduate Summer School, UCLA with **NSF Scholarship**

2012, 2015 & 2016 International Computer Vision Summer School, Sicily - Successful Completion Certificates

▷ Industrial conferences

2016, EMVA Business Conference - Edinburgh

2012 / 2013, World of Industry, Exhibitor - Istanbul

2008, TechCunch 50, Alumni & Exhibitor - San Francisco

2008, NVISION - San Jose

2008, ARCS - Dresden

2007, TechCunch 40, Presenter - San Francisco

2007, Hannover Industrial Fair, Exhibitor - Hannover

2007, ARIF Innovation Festival, Exhibitor - Istanbul

2007, MVTec, Siemens and Intel Training and Workshops - Munich, Nuremberg, Ankara

AWARDS

▷ Personal awards

2016, **EMVA Young Professional Award**. Given to young professionals and novel works with great industrial impact

2014, **Ernst von Siemens Scholarship**, Siemens AG. Given to talented PhD candidates in industry, showing high academic potential

2004, **Merit Scholarship**, Sabanci University for success in University Entrance Exam

2004, Ranked 81^{st} in Istanbul and $\sim 600^{th}$ in Turkey in University Entrance Exam, among $\sim 1.7M$ applicants

2004, Received Robert College **Sait Halman Computer Honor Prize** (Given to one who has great achievements in Computer Science)

▷ Publication awards	**Best Student Paper Award** at International Conference on Computer Vision (ICCV) 2017 Workshop on Multiview Relationships in 3D Data (MVR3D) **Alper Atalay Best Paper Award** at SIU 2013 Ranked 3^{rd}
▷ Entrepreneurial Awards	2011, **Hottest iPhone App** in Photo & Video Category on Apple iTunes Store 2009, Motorola Worldwide Mobile Widget Competition - **Winner** 2009, GTS Tech Start-up Competition - **Finalist**, Presenter 2007, TechCrunch40 Tech Start-up Competition - **Finalist**
▷ Awards in other competitions	2008, Ranked 1^{st} with robot ROBO112 in Projistor Robot Competetion at Dogus University 2008, Ranked 2^{nd} with robot ROBO112 in ITURO Robot Competetion at Istanbul Technical University 2000, Ranked 10^{th} in Izmir Agean Chess Tournament

LANGUAGES

NATIVE LANGUAGE	Turkish
OTHER LANGUAGES	English (Proficient), German (Intermediate)

ABILITIES

PROGRAMMING SKILLS	C/C++, Assembler (SSE, SSE2, SSE3, SSSE3, AVX), CUDA, Matlab, LateX, OpenCV, Halcon, C#, QT, OpenGL, Maple, Python and overall, the ability to adapt to different languages.
HARDWARE SKILLS	Camera Systems (Basler, IDS, Sony, JAI, The Imaging Source etc), Siemens 3D Imaging Sensors, Lighting Systems (Falcon, RVSI, SmartVision), PIC, FPGA, I/O Control Modules, PLCs, Smart Cameras, Framegrabbers and other similar hardware.
HOBBIES	One Frequent Jazz Drummer A Cook in the Evenings Occasional Chess Player A Former Point Guard on Basketball Fields

Muenchen, February 12, 2019

Birdal, Tolga