

# 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	<a href="http://tbirdal.me">http://tbirdal.me</a> , <a href="https://linkedin.com/in/tbirdal">https://linkedin.com/in/tbirdal</a> , <a href="http://campar.in.tum.de/Main/TolgaBirdal">http://campar.in.tum.de/Main/TolgaBirdal</a>
Interests	3D Computer Vision, Machine Vision, Pattern Recognition, High Performance Computing



## EDUCATION

- |                           |   |
|---------------------------|---|
| ▷ Period                  | 2014–Present                                      |
| ◦ Acquired qualifications | <b>Dr. Rer. Nat. (Expected)</b>                   |
| ◦ Institute               | Technical University of Munich                    |
| ◦ Principal subjects      | Informatics                                       |
| ◦ Thesis subject          | Large Scale 3D Object Reconstruction              |
| ▷ Period                  | 2008–2011   |
| ◦ Acquired qualifications | <b>Master of Science</b>                          |
| ◦ 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 | <b>Bachelor of Science</b>                        |
| ◦ Institute               | Sabanci University                                |
| ◦ Principal subjects      | Electronics Engineering                           |
| ▷ Period                  | 1999–2004   |
| ◦ Graduate school         | Robert College                                    |
| ◦ Principal subjects      | Science   |

## PROFESSION

- |            |  |
|------------|--|
| ▷ Period   | 2014–Present   |
| ◦ Employer | <b>Siemens Corporate Technology</b>                                  |
| ◦ Position | Otto Hahn Ring 6, 81739, Muenchen, Deutschland<br>Research Scientist |

- Projects

- ▷ Period

- Employer

- Position

- Supervisor

- Projects

- ▷ Period

- Employer

- Position

- Projects

- ▷ Period

- Employer

- Position

- Projects

- ▷ Period

- Employer

- Position

- Supervisor

- Projects

- ▷ Period

- Employer

- Position

- Supervisor

- Project

- ▷ Period

- Employer

- Position

- Supervisor

- 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.

2014–2014

**Google Summer of Code**

Mountain View, CA, USA

Student

Dr. Vincent Rabaud

Implementation of surface matching algorithms into OpenCV

2010–2014

**Gravi Information Technologies**

Istanbul, Turkey

CEO & Co-Founder

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.

2008–2011

**BeFunky Inc.**

San Francisco, CA, USA

Chief Engineer & Co-Founder

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](http://www.befunky.com))

2009–2010

**Mitsubishi Electric Research Labs**

Cambridge, MA, USA

Intern

Prof. Fatih Porikli

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.

2007

**Carnegie Mellon University**

Pittsburgh, PA, USA

Intern

Prof. Martial Hebert & Dr. Yan. Ke

Shape Matching Algorithm using Spatial Segmentation Data

2005–2007

**Vistek Isra Vision**

Teknokent, Gebze, Turkey

Application Developer

Prof. Aytul Ercil

Development of industrial computer vision systems on OCR/OCV, Bar-code Reading, Robot Control, Object Classification based on Halcon.

## PUBLICATIONS

### ► International Conferences

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**, Umut Simsekli, Onur Eken & Slobodan Ilic: *Bayesian Pose Graph Optimization via Bingham Distributions and Tempered Geodesic MCMC*, Under Review [arxiv.org/abs/1805.12279](https://arxiv.org/abs/1805.12279)

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

**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, 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, Mehmet Ozkanoglu, Abdi Tekin Tatar: *METHOD AND SYSTEM FOR GENERATING ONLINE CARTOON OUTPUTS* Patent application number: 20090219298.

Tolga Birdal, Emrah Bala, Emre Koc, Mehmet Ozkanoglu, Abdi Tekin Tatar: *METHOD AND SYSTEM FOR PROVIDING AN IMAGE EFFECTS INTERFACE* Patent application number: 20100223565.

## CONFERENCES

▷ Academic conferences

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

▷ 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<sup>st</sup> in Istanbul and ~ 600<sup>th</sup> in Turkey in University Entrance Exam, among ~ 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<sup>rd</sup>

▷ 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<sup>st</sup> with robot ROBO112 in Projistor Robot Competition at Dogus University

2008, Ranked 2<sup>nd</sup> with robot ROBO112 in ITURO Robot Competition at Istanbul Technical University

2000, Ranked 10<sup>th</sup> in Izmir Aegean 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, August 6, 2018

Birdal, Tolga