

# Curriculum Vitæ

## Personal Data:

Last Name: Günther  
First Name: Manuel  
Academic Degree: Dr.-Ing.  
Address: 4850 Nightingale Drive B-207  
Colorado Springs, CO 80918  
Tel.: +1 (719) 439 - 2565  
Email: siebenkopf@googlemail.com  
Web page: <http://vast.uccs.edu/~mgunther>  
Day of birth: December 3, 1979  
Place of birth: Leinefelde (Germany)  
Nationality: German



## Academic Career (Summary):

- *2015–present* Research associate at the University of Colorado Colorado Springs (USA)
- *2012–2015* Post-Doc at the Idiap Research Institute in Martigny (Switzerland)
- *2005–2011* Doctorate at the Ruhr-University Bochum (Germany)
- *1999–2005* Diploma at the Technical University of Ilmenau (Germany)

## My Specialties:

- Very good logical and mathematical comprehension
- Fluent in German, English, Python, C++, Java, and  $\LaTeX$
- Experiences in teaching and supervision of bachelor, master, and PhD students
- Proficiency in computer vision, deep learning, and other machine learning techniques
- Extended experience in open source library programming, object oriented programming and GUI programming
- Experiences in other programming languages such as Matlab, C, HTML, R, VHDL, Bash, CMake, and others

## Teaching Experience:

- Undergraduate Course: “Data Structures and Algorithms”, Computer Science Department at the University of Colorado Colorado Springs, 2018
- Tutorial “Bob’s Biometric Recognition Framework - A Hands-on Tutorial with Face Recognition Examples” given at the International Joint Conference on Biometrics, Denver, Colorado, 2017, recordings online available:  
<http://www.youtube.com/playlist?list=PL-M6OZEM9v0FXfgvarnrpTMhURafZbXwp>
- Tutorial “Hands-on Tutorial on 2D Face Recognition” presented in the Biometrics Summer School in Kuala Lumpur, 2016
- Programming Labs for the Graduate Course: “Künstliche Neuronale Netzwerke”, Insitut für Neuroinformatik, Ruhr-Universität Bochum, 2006–2011
- Supervision of Students in the Graduate Seminar: “Selected Topics in Neurocomputing”, Insitut für Neuroinformatik, Ruhr-Universität Bochum, 2008–2011
- Supervision of Bachelor and Master Students, Ruhr-Universität Bochum, 2008–2011
- Supervision of Master and PhD Students, Idiap Research Institute, 2012–2015
- Supervision of Master and PhD Students, University of Colorado Colorado Springs, 2015–present

## List of Projects:

- *2015–present* The Intelligence Advanced Research Projects Activity (IARPA) Janus project  
<http://www.iarpa.gov/index.php/research-programs/janus>
- *2012 and ongoing* The signal-processing and machine learning toolbox Bob  
<http://www.idiap.ch/software/bob>
- *2012–2013* Bayesian Biometrics for Forensics (BBfor2): <http://bbfor2.net>
- *2005–2011* Pattern Recognition and Graph Matching Algorithms (PRAGMA) C++ software library (**never made it not open source**)
- *2006–2009* Classification of genetic syndromes based on facial appearance lead by the Institut für Humangenetik Essen <http://www.uk-essen.de/humangenetik>

## Publication Record:

- Number of Publications: 35; Number of Citations: 553 (at the time of March 12, 2018)
- h-index: 12; i10-index: 13
- Google Scholar page: <http://scholar.google.de/citations?user=N9urlTYAAAAJ&hl=de>

## Research associate in the VAST lab:

Research associate in the Vision and Security Technology (VAST) lab at the University of Colorado Colorado Springs (UCCS) under the supervision of Prof. Dr. Terrance E. Boulton.

Research Topics (to present date):

- Participating in the UMD research group on the IARPA JANUS project <http://www.iarpa.gov/index.php/research-programs/janus>
- Off-pose face recognition using facial attributes
- Open-set and open world face recognition
- Improving Deep Convolutional Neural Networks (DCNN) to recognize people in difficult conditions

Responsibilities:

- Teaching the undergraduate Java programming course “Data Structures and Algorithms”
- Supervision of master and PhD students
- Application for nationally and internationally funded projects
- Software development and maintenance in Python and C++ using the Caffe deep learning framework
- Implementation and comparison of pose-invariant open-set face recognition and face clustering algorithms
- Presenting the “Hands-on Tutorial on 2D Face Recognition” in the Biometrics Summer School in Kuala Lumpur, 2016
- Leading the “Unconstrained Face Detection and Open-Set Face Recognition Challenge” held in collaboration with the International Joint Conference in Biometrics (IJCB) 2017
- Presenting the “Bob’s Biometric Recognition Framework - A Hands-on Tutorial with Face Recognition Examples” at IJCB 2017
- Publication of conference and journal articles
- Reviewer for numerous tier-one and tier-two conferences and journals

September 2015

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present

Vision and Security Lab  
University of Colorado Colorado Springs



## Post-Doc at Idiap:

Post-Doc at the Biometrics Group of the Idiap Research Institute under the supervision of Dr. Sébastien Marcel.

### Research Topics:

January 2012

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June 2015

- Development and maintenance of the Biometric Recognition Framework

<https://www.idiap.ch/software/bob/docs/bob/bob.bio.base/v3.2.1/index.html>

- Development of the open source signal processing and machine learning library Bob

<http://www.idiap.ch/software/bob>

- Development of face detection and facial landmark localization algorithms

### Responsibilities:

- Supervision of master and PhD students and interns
- Open source software development and maintenance in Python and C++
- Implementation and comparison of face recognition algorithms
- Application for nationally and internationally funded projects
- Leading the “Competition on face recognition in mobile environment using the MOBIO database” held in collaboration with the International Conference of Biometrics (ICB) in Madrid, 2013
- Publication of conference and journal articles
- Reviews for Journals TIP, TIFS, IVC, MVAP, NeuNet, SigPro, SMC and ImaVis, and conferences IJCB, BTFS and ACM-MM
- Job interviews for intern and post-doc positions at Idiap



## Doctorate at the INI:

Research assistant at the Institute for Neural Computation, Ruhr-University Bochum under the supervision of PD. Dr. Rolf P. Würtz.

Title of dissertation: *Statistical Gabor Graph Based Techniques for the Detection, Recognition, Classification, and Visualization of Human Faces*

Degree: Doktor-Ingenieur (Dr. Ing.); magna cum laude

September 2005

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August 2011



Research Topics:

- Face detection
- Face recognition
- Classification of genetic syndromes
- Visualization of texture features

Responsibilities:

- Leading the student exercise for the course “Artificial Neural Networks”
- Software development in C++ and Java
- Publication of journal articles
- Periodical project presentations
- Supervision of bachelor and master theses

## Education:

1999 – April 2005	Computer Science Studies at the Technical University Ilmenau (Germany), Specialization: Face Recognition / Biometry  Degree: Diplom-Informatiker; Final grade: 1.8  Title of diploma thesis: <i>Klassifikation von Gesichtern mit optimierten lokalen Graphen</i> (Classification of faces with optimized local graphs), written at the C-VIS GmbH in Bochum
1994 – 1998	Abitur at the special school for mathematics and natural science of the Albert-Schweizer Gymnasium in Erfurt (Germany)  Specialization: mathematics, computer science  Final grade: 1.9
1986 – 1994	Attending the schools: Polytechnische Oberschule Küllstedt (former German Democratic Republic) and St. Josef Gymnasium Dingelstädt (Germany)

## **In Between:**

September 2011  
–  
December 2011

Preparation and submission of conference papers

July 2005  
–  
August 2005

Software engineer at the C-VIS GmbH:  
Integration of biometric information into ID cards

November 1998  
–  
August 1999

Basic military service in the German army

## List of Publications:

- **C. Li, M. Günther, T. E. Boulton**  
*ECLIPSE: Ensembles of Centroids Leveraging Iteratively Processed Spatial Eclipse Clustering*  
in: International Conference of Winter Applications in Computer Vision (WACV), 2018
- **A. Rozsa, M. Günther, T. E. Boulton**  
*Towards Robust Deep Neural Networks With BANG*  
in: International Conference of Winter Applications in Computer Vision (WACV), 2018
- **M. Bihn, M. Günther, D. Lemmond, T. E. Boulton**  
*Evaluating a Convolutional Neural Network on ShortWave Infra-Red Images*  
in: International Conference of Winter Applications in Computer Vision (WACV) Cross-Domain Face Recognition Workshop, 2018
- **M. Günther, A. Rozsa, and T. E. Boulton**  
*AFFACT: Alignment-Free Facial Attribute Classification Technique*  
in: International Joint Conference on Biometrics (IJCB), 2017
- **M. Günther and others**  
*Unconstrained Face Detection and Open-Set Face Recognition Challenge*  
in: International Joint Conference on Biometrics (IJCB), 2017
- **A. Rozsa, M. Günther, and T. E. Boulton**  
*LOTS about Attacking Deep Features*  
in: International Joint Conference on Biometrics, 2017
- **A. Anjos, M. Günther, and T. de Freitas Pereira, P. Korshunov, A. Mohammadi, S. Marcel**  
*Continuously Reproducing Toolchains in Pattern Recognition and Machine Learning Experiments*  
in: International Conference on Machine Learning (ICML) Workshop on Reproducibility in Machine Learning, 2017
- **A. Rozsa, M. Günther, and T. E. Boulton**  
*Adversarial Robustness: Softmax versus Openmax*  
in: British Machine Vision Conference (BMVC), 2017
- **M. Günther, S. Cruz, and T. E. Boulton**  
*Toward Open-Set Face Recognition*  
in: IEEE Conference on Computer Vision and Pattern Recognition (CVPR) Workshops, 2017.
- **James Henrydoss, Steve Cruz, Ethan M. Rudd, Manuel Günther, and Terrance E. Boulton**  
*Incremental Open Set Intrusion Recognition Using Extreme Value Machine*  
in: IEEE International Conference on Machine Learning and Applications (ICMLA), 2017.  
**Won the Best Poster award.**



- **E. M. Rudd, A. Rozsa, M. Günther, and T. E. Boul**  
*A Survey of Stealth Malware: Attacks, Mitigation Measures, and Steps Toward Autonomous Open World Solutions*  
 in: IEEE Communications Surveys & Tutorials, 2017.
- **A. Rozsa, M. Günther, and T. E. Boul**  
*Are Accuracy and Robustness Correlated?*  
 in: IEEE International Conference on Machine Learning and Applications (ICMLA), 2016.
- **A. Rozsa, M. Günther, E. M. Rudd, and T. E. Boul**  
*Are Facial Attributes Adversarially Robust?*  
 in: International Conference on Pattern Recognition (ICPR), 2016.  
**Won the Best Student Paper award.**
- **E. M. Rudd, M. Günther, and T. E. Boul**  
*MOON: A Mixed Objective Optimization Network for the Recognition of Facial Attributes*  
 in: IEEE European Conference of Computer Vision (ECCV), 2016.
- **E. M. Rudd, M. Günther, and T. E. Boul**  
*PARAPH: Presentation Attack Rejection by Analyzing Polarization Hypotheses*  
 in: IEEE Conference on Computer Vision and Pattern Recognition (CVPR) Workshops, 2016.
- **M. Günther and L. El Shafey and S. Marcel**  
*Face Recognition in Challenging Environments: An Experimental and Reproducible Research Survey*  
 in: Face Recognition across the Electromagnetic Spectrum, Springer, 2016.
- **M. Günther, S. Böhringer, D. Wiczorek, and R. P. Würtz**  
*Reconstruction of Images from Gabor Graphs with Applications in Facial Image Processing*  
 in: Journal of Wavelets, Multiresolution and Information Processing, 2015.
- **R. Metha, M. Günther, and S. Marcel**  
*Gender Classification by LUT based boosting of Overlapping Block Patterns*  
 in: Scandinavian Conference on Image Analysis (SCIA), 2015.
- **A. Dutta, M. Günther, L. El Shafey, S. Marcel, R. Veldhuis, and L. Spreeuwers**  
*Impact of Eye Detection Error on Face Recognition Performance*  
 in: IET Biometrics, January 2015.
- **M. I. Mandasari, M. Günther, R. Wallace, R. Saedi, S. Marcel and D. van Leeuwen**  
*Score Calibration in Face Recognition*  
 in: IET Biometrics, 2014.
- **E. Khoury, L. El Shafey, C. McCool, M. Günther and S. Marcel**  
*Bi-modal Biometric Authentication on Mobile Phones in Challenging Conditions*  
 in: Image and Vision Computing (IVC), 2014.
- **E. Khoury, M. Günther, L. El Shafey and S. Marcel**  
*On the Improvements of Uni-modal and Bi-modal Fusions of Speaker and Face Recognition for Mobile Biometrics*  
 in: Biometric Technologies in Forensic Science (BTFS), 2013.

- **M. Günther and others**  
*The 2013 Face Recognition Evaluation in Mobile Environment*  
 in: The 6th IAPR International Conference on Biometrics (ICB), 2013.
- **E. Khoury and others**  
*The 2013 Speaker Recognition Evaluation in Mobile Environment*  
 in: The 6th IAPR International Conference on Biometrics (ICB), 2013.
- **R. P. Kosilek and others**  
*Automatic Face Classification of Cushings Syndrome in Women – A Novel Screening Approach*  
 in: Experimental and Clinical Endocrinology & Diabetes, 2013.
- **M. Günther, R. Wallace and S. Marcel**  
*An Open Source Framework for Standardized Comparisons of Face Recognition Algorithms*  
 in: European Conference on Computer Vision (ECCV), Workshops and Demonstrations: pages 547-556, 2012.
- **A. Anjos, L. El Shafey, R. Wallace, M. Günther, C. McCool and S. Marcel**  
*Bob: a Free Signal Processing and Machine Learning Toolbox for Researchers*  
 in: Proceedings of the ACM Multimedia Conference (ACMMM), 2012
- **M. Günther, D. Haufe and R. P. Würtz**  
*Face Recognition with Disparity Corrected Gabor Phase Differences*  
 in: International Conference of Artificial Neural Networks and Machine Learning (ICANN): pages 411-418, 2012.
- **M. Günther**  
*Statistical Gabor Graph Based Techniques for the Detection, Recognition, Classification, and Visualization of Human Faces*  
 PhD thesis, Fakultät für Informatik und Automatisierung, Technische Universität Ilmenau, 2011.
- **S. Böhringer and others**  
*Genetic determination of human facial morphology: links between cleft-lips and normal variation*  
 in: European Journal of Human Genetics, 2011.
- **H. J. Schneider and others**  
*A Novel Approach to the Detection of Acromegaly: Accuracy of Diagnosis by Automatic Face Classification*  
 in: Journal of Clinical Endocrinology and Metabolism, Volume 96/2, 2011
- **S. Böhringer, M. Günther, S. Sinigerova, R. P. Würtz, B. Horsthemke, and D. Wiczorek**  
*Automated Syndrome Detection in a Set of Clinical Facial Photographs*  
 in: American Journal of Medical Genetics, 2011
- **M. Günther, M. K. Müller and R. P. Würtz**  
*Two Kinds of Statistics for Better Face Recognition*  
 in: International Conference of Numerical Analysis and Applied Mathematics, pages 1901-1904, 2010

- **M. Günther and R. P. Würtz**

*Face Detection and Recognition Using Maximum Likelihood Classifiers on Gabor Graphs*  
in: International Journal of Pattern Recognition and Artificial Intelligence (Special Issue: Facial Image Processing and Analysis), volume 23/3, pages 433-461, 2009

- **M. Günther**

*Klassifikation von Gesichtern mit optimierten lokalen Graphen auf 2D und 3D Bilddaten*  
Diploma thesis, Fakultät für Informatik und Automatisierung, Technische Universität Ilmenau, 2005.