

## Education

- 2005–2009 **Bachelor of Mechanical Engineering and Automation**, *Southwest Jiaotong University*, Chengdu, China, *Grade: 85/100*.  
Mechatronics
- 2009–2010 **M.Sc in Advanced Control and System Engineering**, *School of Electrical and Electronic Engineering, University of Manchester*, UK, *Grade: Distinction (first-class)*.  
Dynamic System · Feed-back Control
- 2011–2015 **Graduate School of Computer Science**, *Saarland University*, Germany, *Grade of Courses: 1.6, PhD candidate*.  
Image Processing and Computer Vision · Variational Method · Machine Learning · Optimization
- 2015–now **Institute of neural information processing**, *Ulm University*, Germany, PhD candidate.  
Human behaviour analysis for elder healthcare

## Working Experience

- Nov. 2011 – **Research Assistant**, *Human-Computer Interaction Group, Department 4, Max-Planck Institute of Informatics*, Saarbrücken.  
May. 2012
- Nov. 2012 – **Researcher**, *Mathematical Image Analysis Group, Computer Science School, Saarland University*, Saarbrücken.  
Feb. 2015
- Mar. 2015 – **Research Assistant**, *Medical and Biological Informatics, German Cancer Research Center*, Heidelberg.  
Dec. 2015
- Dec. 2015 – **Research Assistant**, *Institute of neural information processing, Ulm University*, Ulm.  
Now

## Projects (since 2011)

- **High Level Computer Vision**: (a) Traffic Sign Detection and Categorization using A Kernel-based Learning Algorithm (**Keywords**: Matlab · machine learning )
- **Human-Computer Interaction**: Developing a novel keyboard layout on an Android tablet using computational methods. (**Keywords**: Android)
- **3D Reconstruction**: Object Scanning and Surface Reconstruction using A RGB-D Camera. (**Keywords**: Iterative Closest Point Algorithm · Kinect · Visual C++)
- **Image Restoration**: Noise Removal in 3D CT Images using Anisotropic Diffusion. (**Keywords**: Nonlinear Partial Differential Equation · Industrial CT Image Stack · C)

- **A Higher-Order Variational Coupling Model:** A Higher-order Variational Coupling Model: continuous theories in the Sobolev space, novel finite difference scheme and convexity, applications on image analysis.
- **Image Segmentation:** A Level-Set Method based on a Novel Edge Detector. ( **Keywords:** higher-order variational model · Geodesic Active Contour · Optimization · C )
- **Biomedical Engineering:** Tissue Classification for Laparoscopic Image Understanding based on Multispectral Texture Analysis (**Keywords:** local binary pattern · multispectral imagery · support vector machine · Python )
- **Human Behavior Analysis:** Simulation of disorientation and motor functionalities of elderly people in the lab. (**Keywords:** cognitive impairment reproduction · search experiments · multi-model dataset (video, audio, mocap, etc.) · empirical experiments )
- **Human Behavior Analysis:** Disorientation recognition based on video recordings (**Keywords:** multi-scale analysis · person 3D tracking · walking path and motion energy analysis · action consistency represented by Fisher vectors · state-of-the-art performance (better than deep learning) )
- **Human Behavior Analysis:** Continuous activity understanding and early recognition (**Keywords:** pose-context pattern · accumulative learning scheme · early recognition without observing the entire video)
- **Human Behavior Analysis:** Temporal action segmentation via dynamic clustering (**Keywords:** unsupervised method · online learning · fast response · superior to state-of-the-art method)
- **Human Behavior Analysis:** Human motion parsing via hierarchical dynamic clustering (**Keywords:** unsupervised method · online learning · fast response · superior to state-of-the-art method · fainting/falling detection)
- **Human Behavior Analysis:** Adaptive resonance network on human tracking (**Keywords:** novel deep learning method · online learning · superior to state-of-the-art method)
- **Software Engineering:** Developing new features and debugging in the MITK software (**Keywords:** git · C++ · QT )
- **Software Engineering:** Development of Social Signal Interpretation (SSI), setup recording system in the lab (**Keywords:** git · C++ · OpenCV )

## Publications and Reports

- A. Oulasvirta, A. Reichel, W. Li, Y. Zhang, M. Bachynskyi et al. Two-thumb text entry on touchscreen devices. (CHI'13), April 2013.
- M. Bildhauer, M. Fuchs, J. Weickert, Y. Zhang. An Alternative Approach Towards The Higher-Order Denoising of Images. (manuscript of 60 pages for a mathematical journal), 2013-2014
- Yan Zhang, et al. "Tissue classification for laparoscopic image understanding based on multispectral texture analysis." Medical Imaging 2016: Image-Guided Procedures, Robotic Interventions, and Modeling. Vol. 9786. International Society for Optics and Photonics, 2016.
- Yan Zhang et al. "Tissue classification for laparoscopic image understanding based on multispectral texture analysis." Journal of Medical Imaging 4.1 (2017): 015001.
- Velana, Maria, et al. "The SenseEmotion Database: A Multimodal Database for the Development and Systematic Validation of an Automatic Pain-and Emotion-Recognition System." IAPR Workshop on Multimodal Pattern Recognition of Social Signals in Human-Computer Interaction. Springer, Cham, 2016.

- Yan Zhang, et al. "Visual Confusion Recognition in Movement Patterns from Walking Path and Motion Energy." International Conference on Smart Homes and Health Telematics. Springer, Cham, 2017.
- Yan Zhang, Georg Layher, and Heiko Neumann. "Continuous activity understanding based on accumulative pose-context visual patterns." 2017 Seventh International Conference on Image Processing Theory, Tools and Applications (IPTA) . IEEE, 2017.
- Yan Zhang, He Sun, Siyu Tang, Heiko Neumann. "Temporal Human Action Segmentation via Dynamic Clustering." arXiv preprint arXiv:1803.05790 (2018).

## Languages

Chinese	<b>Native</b>	<i>simplified Chinese</i>
English	<b>Professional</b>	<i>scientific writing</i>
German	<b>Basic</b>	<i>TELC B1</i>

## Additional Skills

Programming	C/C++, CUDA, OpenCV, Matlab, Python, Cython, tensorflow, caffe
System	Unix/Linux, Android, IOS
Software	Latex, Git, Eclipse, Cmake, CAD, Pro/E
Others	Chartered Financial Analyst Level-1

## Interests

Music	guitar, music composition
Sports	table tennis, hiking
Relaxing	meditation