# Ou, Changkun

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Last update: March 21, 2021

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# Curriculum Vitae

*Science and art, life in between*

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## Introduction

Changkun Ou is a research assistant at the University of Munich. His research topics are interdisciplinary in human-computer interaction, computational geometry, and imitation learning. In particular, he would like to leverage three-dimensional polygonal mesh representation learning and visual preference elicitation to develop efficient algorithms or industrial tools for 3D modeling and rendering, and therefore improve users' workflow efficiency in 3D modeling.

## Education

**University of Munich (LMU)**                                                            Munich, Germany

*Ph.D. Candidate in Media Informatics.*                                                  *Feb. 2019 – Present*

**University of Munich**                                                                 Munich, Germany

*Master of Science in Computer Science; GPA: 2.05/1.00*                                   *Apr. 2018 – Jan. 2019*

**University of Munich**                                                                 Munich, Germany

*Master of Science in Human-Computer Interaction (HCI); GPA: 1.63/1.00*                   *Oct. 2016 – Jan. 2019*
  - **Transcript**: Link
  - **Thesis**:   *Understanding and Predicting Web Browsing Behavior.*

**University of Electronic Science and Technology of China (UESTC)**                     Chengdu, China

*Master of Engineering in Software Engineering*                                          *Aug. 2016 – Sep. 2016*

**Southwest University for Nationalities (SWUN)**                                         Chengdu, China

*Bachelor of Engineering in Computer Science; Grade: 3.74/4.00, "Top 1 Student".*         *Sep. 2012 – Jul. 2016*
  - **Transcript**: Link
  - **Thesis**:   *Designing Alternative Contact-free Control Modalities for Smart Watches.*

**First Middle School of Zhijiang**                                                      Huaihua, China

*Senior Middle School; With university entrance examination (Gaokao)*                     *Mar. 2010 – Jul. 2012*

**Changsha Foreign Language School**                                                      Changsha, China

*Senior Middle School*                                                                    *Aug. 2009 – Feb. 2010*

**Second Middle School of Zhijiang**                                                      Huaihua, China

*Junior Middle School*                                                                    *Sep.2006 – Jul.2009*

**Chengnan Primary School of Zhijiang**                                                   Huaihua, China

*Primary School*                                                                          *Sep. 2000 – Jul. 2006*

## Work Experiences

### Research Assistant
*University of Munich*

Munich, Germany

*Aprl. 2018 – Present*

- ○ **Instructor**: I am responsible for the design and teaching of the Practical Geometry Processing course. In the class, I mainly teach students about geometry processing algorithms, practice how to implement them from scratch, and eventually writing reproducible rendering scripts in Blender. Resources are on GitHub.
- ○ **DevOps**: I am responsible for compatibility development work and the execution of the eventual migration operation of a 15 years old PHP and SVN-based CMS system that was developed in 2005. Resources are on GitHub.
- ○ **Teaching assistant**: I am responsible for the design and organization of the practical part of the Lecture Computer Graphics. Behind the scene, the whole coding exercises are redesigned for the fit of modern topics in graphics. Resources are on GitHub.
- ○ **Teaching assistant**: I am one of the responsible people for the design and organization of the practical part of Lecture Online Multimedia. Behind the scene, I bring novel web development topics into the teaching, such as React, Docker, Kubernetes, etc. Resources are on GitHub.
- ○ **Teaching assistant**: I am responsible for the organization of Seminar Advances in Computer Graphics.
- ○ **Tutor**: Deep Learning and Artificial Intelligence, notes on GitHub
- ○ **Tutor**: Machine Learning, notes on GitHub.

### Backend Software Engineer (Remote)
*LabEx Technology Ltd*

Chengdu, China

*Apr. 2018 – Jan. 2019*

- ○ **Team leader and leading backend development of the oversea product**: I lead and responsible for the product development in backend and frontend. I evolve the existing architecture and split a monolithic backend web application into multiple microservices. The product scales machine cluster from 20 to 200 for active daily users, and its user group increases from 5k to 30k during my incumbency.
- ○ **Remote desktop control proxy**: I responsible for and developed a middleware that provides generic remote desktop proxy in Go. The proxy translates VNC/RDP/SSH protocol data, and establish WebSocket connection to a web browser for providing remote desktop GUI.
- ○ **Multi-cloud automation**: I developed a fully automated multi-cloud resource management microservice in Go. The service defines a general abstraction cross all cloud provider, it automatically manages all user requested resources allocation and releases outdated resources. For instance, a user of the service can allocate new cloud instances for temporal using without noticing the instance was allocated in either AWS, AlibabaCloud, or others. The service supports more than 15 cloud products and integrated 3 cloud providers, being able to support almost unlimited concurrent users and has been used by 10k+ users.
- ○ **Cluster management service**: I developed a microservice in Go that similar to Kubernetes and Docker Swarm. The service manages multiple server clusters, and auto-scaling its cluster size upon request cross multiple cloud providers. Each cluster contains multiple physical machines, and each machine runs many docker containers. The key feature of the service eliminates the difference between the physical machine and the docker container. The runtime of the service includes a system monitor with request prediction algorithm that I invented for efficient auto-scaling with consideration of overcommit ratio and a task scheduler for managing all distributed asynchronous task execution with two-level caching optimization.
- ○ **Used tech. stack**: Vue, jQuery, Webpack, Electron; Backend: Go, Cgo, Gin, Beego, gRPC, MySQL, MongoDB, Redis, Hypervisor, Nginx, Docker, Kubernetes, AWS, AlibabaCloud, etc.

### Fullstack Engineer (Freelance)
*Rocketlingo UG*

Munich, Germany

*Nov. 2017 – Mar. 2018*

- **Language teaching voice bot**: I am part of the team in developing a voice bot that provides English learning teaching service. The bot can communicate with its user and improve their English skill by the real-time response. My responsibility is to implement the backend support designed conversations using Amazon Alexa.
- **Speech recognition solution & Web development**: I responsible for the development of speech recognition solution over web technologies, such as using WebSocket for audio streaming, using Google Cloud STT and TTS services for speech recognition and synthesis, etc. The challenging part of using existing speech recognition service for a language learning application is a new language learner sometimes does not produces positive audio samples, and even multilingual. Therefore, I developed many text-based falt tolerances technique for improving the understanding of user speech based on machine learning algorithms.

### Shiyanlou
Chengdu, China

*Software Engineer (Intern)*
*Jun. 2016 – Sep. 2016*

- **Recommendation System**: Online course recommendation system; Python; MongoDB; Collaborate Filtering
- **Distributed Log System**: Elasticsearch; Logstash; Kibana; Redis
- **Cross Platform Desktop Client**: Electron based development for macOS/Windows/Linux
- **Teaching Meterial Writing**: Modern C++ based teaching meterial writing

### Academic Tutor
Chengdu, China

*SWUN Lecture "Human-Computer Interaction"*
*Jul. 2015*

## Skills

- I am specialized in computer graphics, machine learning, and modern web development using **go**; **javascript**; **c/c++**; **python**; markdown; LaTeX. I also speak native Chinese; fluent professional English; elementary German.

- **Certificates:** Coursera, Andrew Ng: Deep Learning Specializations, certificates: 1, 2, 3, 4, 5

## Open Source Contribution

- **Tensorflow (151+ stars)**: Contributor
- **Go (79.6k+ stars)**: Contributor
- **Modern C++ Tutorial (10.3k+ stars)**: I am the author of the book. The book provides the state-of-the-art content towards modern C++, which includes C++11/14/17/20.
- **The golang.design Initiative**: I am the founder of the organization.
- **Go under the hood (2.4k stars)**: I am the author of the book, this book is part of the golang.design initiative. The book discusses Go source code, includes its runtime scheduler, garbage collection, compiler and etc.
- **Official Tensorflow document translation (3.7k+ stars)**: I am the main contributor and project maintainer.
- **Juejin Translation Public Community (27.8k+ stars)**: Major contributor, translated 50+ articles. Main reviewer of AI related articles.
- **The Swift Programming Language Chinese Translation (19.9k+ stars)**: Major contributor (in Swift 1.x). The translation was officially acknowledged by Apple Inc.
- **occamy**: The project implements a modern remote desktop proxy written in Go. It provides web browser GUI for connecting vnc/rdp/ssh servers.
- **gomat**: The package providds cache-aware lock-free tiling optimization matrix utilities in Go.
- **sched**: The package for a high performance reliable task scheduling in Go.
- **Check my GitHub homepage for more projects**: github.com/changkun

## Selected Publications

- Changkun Ou, Daniel Buschek, Malin Eiband, Andreas Butz *Modeling Web Browsing Behavior across Tabs and Websites with Tracking and Prediction on the Client Side.* arXiv:2103.04694 preprint, March 2021. English.

- Kai Holländer, Luca Schellenberg, Changkun Ou, Andreas Butz *All Fun and Games: Obtaining Critical Pedestrian Behavior Data from an Online Simulation* In ACM CHI Conference on Human Factors in Computing Systems, Late-Breaking Work, April 25, 2020, Honolulu, HI, USA. English

- Changkun Ou, Yifei Zhan, Yaxi Chen. *Identifying Malicious Players in GWAP-based Disaster Monitoring Crowdsourcing System.* In IEEE ICAIBD' 19: Proceedings of the 2nd International Conference on Artificial Intelligence and Big Data. Chengdu, Sichuan, China, May 25-28, 2019. English, Slides.

- Changkun Ou, Jingyi Li, Yong Ma. *Cultivation and Incentivization of HCI Research and Community in China: Taxonomy and Social Endorsements.* In CHI'19 Workshop on "HCI in China: Research Agenda, Education Curriculum, Industry Partnership, and Communities Building", Glasgow, UK, May 2019, 2019. English, Poster.

- Changkun Ou, Malin Eiband(advisor), Daniel Buschek(co-advisor), Heinrich Hußmann(responsible professor). *Understanding and Predicting Web Browsing Behavior.* 2019, **Master Thesis**.

- Changkun Ou. *An Introduction to Recent Mobile Affective Inference Techniques: Methods, Applications and Challenges.* In Advanced Seminar Media Computer Science, IFI LMU, 2018. English, Slides.

- Matthias Geiger, Changkun Ou, Cedric Quintes. *WatchOut: A Road Safety Extension for Pedestrians on a Public Windshield Display.* In Lercture Advanced Topics in HCI, IFI LMU, 2017. Arxiv preprint. Poster.

- Changkun Ou, Yaxi Chen(advisor), Andreas Butz(co-reviwer). *Designing Alternative Contact-free Control Modalities for Smart Watches.* 2016, **Bachelor Thesis**. Simplified Chinese, English Video

- Yaxi Chen, Changkun Ou. *Combining Touch Biometrics and Motion Sensors for Hand Posture Recognition and User Authentication System.* In Journal of Southwest University for Nationalities(Nature Science Edition). 2016, 42(4):429-435. Simplified Chinese

- Yaxi Chen, Changkun Ou, Zhaoyang Guo. *Space interactions based on monocular vision and simple gestures.* In Journal of Southwest University for Nationalities(Natural Science Edition). 2014, 40(16):871-876. Simplified Chinese

- Changkun Ou, Mu Huang, Mengxin Shi, Jiang Cheng. *A Study in Keep-Right-Except-To-Pass Rule.* In The Mathematical Contest in Modeling, 2014, **Meritorious Winner** English

## Selected Talks

- Changkun Ou. *Delicate Dance: Preferences in Interactive Meshing.* Internal Doctoral Colloquium (IDC). 2021. English.

- Changkun Ou. *A Future of Polygon Reduction.* IDC. 2020. English.

- Changkun Ou. *Go 2 Generics? A (P)review.* Go Night Reading Meetup, 2020. English.

- Changkun Ou. *Go 2 Generics? A (P)review.* Go Night Reading Meetup, 2020. English.

- Changkun Ou. *Technological Outlook.* Online Multimedia, 2019. English.

- Changkun Ou. *Understanding Communicating Sequential Processes.* Go Night Reading Meetup, 2019. English.

- Changkun Ou. *Simplicity is complicated: On the balance of performance and knobs.* Internal Doctoral Colloquium. 2019. English.

- Changkun Ou. *Real-world Go Concurrency Bugs.* Go Night Reading Meetup, 2019. Chinese.

- Changkun Ou. *Internals of Channel and Select in Go.* Go Night Reading Meetup, 2019. Chinese.

- Changkun Ou. *Identifying Malicious Players in GWAP-based Disaster Monitoring Crowdsourcing System.* ICAIBD 2019. English.

- Changkun Ou. *Understanding Generalization in Deep Learning.* Advanced Seminar Deep Learning, IFI LMU, 2018. English, Video.

## Honors & Awards

- **Papers with Special Recognitions** — Munich, Germany
  *Outstanding Reviews* — Nov. 2019

- **Siemens AILab Hackathon** — Munich, Germany
  *2nd Winner* — Nov. 2017

- **China National Scholarship** — Chengdu, China
  *at UESTC* — Sep. 2016

- **Excellent Bachelor Graduation Thesis Award** — Chengdu, China
  *at SWUN* — Jun. 2016

- **Best University Graduates Student Award** — Chengdu, China
  *at Sichuan Province* — Jan. 2016

- **Outstanding Student Scholarship** — Chengdu, China
  *at SWUN* — Nov. 2015

- **Student Innovative Annual Excellent Project** — Chengdu, China
  *at SWUN* — Jun. 2015

- **Sichuan Province Computer Production Competition** — Chengdu, China
  *2nd Award* — May 2015

- **China National Scholarship** — Chengdu, China
  *at SWUN* — Sep. 2014

- **American Mathematical Contest in Modeling(MCM) 2014** — Chengdu, China
  *Meritorious Winner* — Apr. 2014

## Public Activities

- **Presenter**  
  at *The ACM CHI Conference on Human Factors in Computing Systems*  
  Glasgow, UK  
  *May. 2019*

- **Student Volunteer**  
  at *Conference Smart Graphics 2015*  
  Chengdu, China  
  *Aug. 2015*

- **Guigu Lab Team Leader**  
  at *SWUN*  
  Chengdu, China  
  *Sep. 2014 – Jun. 2015*

- **Mathematical Modeling Association Academic Vice Director**  
  at *SWUN*  
  Chengdu, China  
  *Oct. 2012 – Jun. 2014*

## Personal Interests

- **Open source contributions**: Writting open source book; Contributing and maintaining open source softwares
- **Video blogging**: Making videos on YouTube channel
- **Blogging and knowledge sharing**: on https://changkun.de
- **Video gaming**: Sony Playstation and Nintendo Switch player

## References

- **Prof. Andreas Butz**: LMU Munich Medieninformatik, Munich, Germany
- **Prof. Heinrich Hußmann**: LMU Munich Medieninformatik, Munich, Germany
- **Dr. Daniel Buschek**: University of Bayreuth, Bayreuth, Germany
- **Malin Eiband**: LMU Munich Medieninformatik, Munich, Germany
- **Florian Lachner**: Google, Munich, Germany
- **Prof. Yaxi Chen**: Southwest University for Nationalities, Chengdu, China
- **Prof. Wei Zhou**: Southwest University for Nationalities, Chengdu, China