

INTRODUCTION

I am a Ph.D. candidate in human-computer interaction at the Institute of Informatics, LMU Munich (Germany). My research is about human-in-the-loop 3D graphics systems in which I use machine learning to explore and exploit human preferences and improving their decision making. Thus, my research is in interdisciplinary between machine learning, 3D graphics, and user modeling.

EDUCATION

Ph.D. Student Media Informatics (Dr. rer. nat.)

LMU Munich

- **Advisors:** Prof. Dr. [Andreas Butz](#) (Erstberichterstatter), Prof. Dr. [Eyke Hüllermeier](#) (Zweitberichterstatter)

Feb. 2019 – (exp.) Feb. 2023

Munich, Germany

Master Student Human-Computer Interaction (M.Sc.)

LMU Munich; overall grade: 1.63 (max. 1.0) between “Very Good” and “Good”

- **Thesis:** “Understanding and Predicting Web Browsing Behavior”
- **Advisors:** Dr. [Daniel Buschek](#), Dr. [Malin Eiband](#), Prof. Dr. [Heinrich Hußmann](#)

Oct. 2016 – Jan. 2019

Munich, Germany

Master Student Software Engineering

University of Electronic Science and Technology of China

Aug. 2016 – Sep. 2016

Chengdu, China

Bachelor Student Computer Science and Engineering (B.Eng.)

Southwest University for Nationalities; overall grade: 3.74 (max. 4.0), “Top 1” of 154 students

- **Thesis:** “Designing Alternative Contact-free Control Modalities for Smart Watches”
- **Advisor:** Prof. Dr. [Yaxi Chen](#)

Sep. 2012 – Jul. 2016

Chengdu, China

University Entrance Exam

Overall grade: 512 (max. 750, first/second/third tiers: 520/451/357).

Sep. 2000 – Jul. 2012

Huailu, China

PROFESSIONAL EXPERIENCE

Research Associate

LMU Munich

- **As researcher:** research on human-in-the-loop machine learning 3D graphics systems
- **As teacher:** teach 12 classes (as lecturer/instructor/assistant/tutor), and supervising 20+ student theses and seminars
- **As developer:** develop a 3D mesh processing backend system in collaboration with industry partner [WAY digital solutions](#); develop, migrate, and maintain a 17 year-old [university CMS system](#), and a 13 year-old [collaborative system](#)

Apr. 2018 – Present

Munich, Germany

Backend Software Engineer (Remote)

LabEx Technology Ltd

- **As team leader:** leading developments of an oversea product; established microservice based backend architecture; the product autoscales cloud instances (on AWS/AlibabaCloud) ranging from 20 to 200; the product user group grows from 5k+ to 30k+ during my incumbency.
- **As developer:** 1) developed a scalable remote desktop proxy (support WebSocket to VNC/RDP/SSH protocols) using Go; 2) developed an automated multi-cloud resource management microservice that abstracts cross cloud providers (supports AWS/AlibabaCloud over 15 cloud products, e.g., IAM/EC2/VPC/etc), scales and used by 10k+ users; 3) developed a kubernetes-like container and instance hybrid management service.
- **Involved techniques:** Frontend: Vue, jQuery, Webpack, Electron; Backend: Go, Cgo, Gin, Beego, gRPC, MySQL, MongoDB, Redis, Hypervisor, Nginx, Docker, Kubernetes, AWS, AlibabaCloud, etc

Apr. 2018 – Jan. 2019

Munich, Germany

Fullstack Engineer (Freelance)

Rocketlingo UG

Nov. 2017 – Mar. 2018

Munich, Germany

- **As developer:** developed a voice bot to support novice language learner to improve their language skills by real-time voice recognition and synthesis (supports web and Amazon Alexa), optimize for audio streaming and multilingual fault tolerances using machine learning
- **Involved techniques:** TypeScript; WebSocket; Angular; Google Cloud STT and TTS; Sklearn; Voice Recognition; etc

Software Engineer (Intern)

Jun. 2016 – Sep. 2016

Shiyanlou

Chengdu, China

- **As developer:** developed a cross-platform desktop software using Electron; developed a recommendation system for E-learning recommendation; deployed and operates a logging system for internal data analysis
- **As content creator:** wrote more than 20+ professional educational materials regarding C++
- **Involved techniques:** C++; Python; MongoDB; Collaborate Filtering; Elasticsearch; Logstash; Kibana; Redis; Electron, etc.

OPEN SOURCE ACTIVITIES AND ORGANIZATIONS

A public [statistics](#) indicates that I have earned 18.2k+ stars, 14.2k+ total code commits, 30 contributed open source projects. A public contribution [ranking](#) indicates I am a **top 200 developer in Germany** or a **top 100 developer in China**. See github.com/changkun for more authored softwares (including frameworks/tools). Here lists a few selected activities and organizations:

- **Go (organization member):** an open sourced programming language developed by a team at Google, and have approx. [2 million developer users](#) in the globe. I am one of the official Go organization member (163 people in total), current maintainer of x/mobile repository, active contributor to language runtime and standard library.
- **fyne (organization member):** an open sourced cross platform GUI framework written in Go, and I am one of the organization member (12 people in total), mainly contributing to graphics and mobile drivers, performance improvements.
- **The golang.design Initiative (founder):** I created the organization. The organization currently hosts 25 software projects and 6 core members. The organization website have 465k+ page views and 66k+ historical viewers in total since Sep 2020.
- **The TalkGo community (organization member):** I am a core member of the organization. The community organizes weekly public tech talks, currently have [6.35k+ subscribers](#), organized 132 public talks. I contributed 7 talks, and they are one of the most viewed talks.
- **Juejin Translation Community (organization member):** Major contributor, translated 50+ articles from English to Chinese.
- **Occasional contributions:** [Tensorflow](#) (164+ stars), [etcd](#) (39.6k+ stars), etc.

EXPERTISE AND SKILLS

Expertise is context- and comparison-dependent. Here states the years of experience in terms of use, also indicates a subjective estimation of the level of expertise (either *intermediate*, *experienced*, or *expert*):

- **Domain:** *Computer graphics* (3D rendering and geometry processing, 3 years of Bachelors level teaching at university, 2 years of Masters level teaching, Blender/OpenGL/Metal/three.js, *experienced*); *Machine learning* (1 year of Masters level teaching at university, Andrew Ng’s Deep Learning Specialization Certificate (ID: [QGH8ZVJ6J2L2](#)), Sklearn/Tensorflow/PyTorch/etc, *experienced*); *Data analysis* (3 years of PhD research, numpy/seaborn/pandas/etc., *experienced*); *Web development* (2 years of industrial backend engineering, Go/React/etc., *experienced*).
- **Language:** *Go* (5 years+, *expert*); *Python* (4+ years, *experienced*); *JavaScript/TypeScript* (5+ years, *experienced*); *C/C++* (2+ years, *intermediate*); *TEX* (10+ years, *intermediate*). I speak native Mandarin; fluent professional English; elementary German.

SCHOLARSHIPS AND AWARDS

ACM SIGCHI Special Recognitions (CHI '20)

Outstanding Reviews

Nov. 2019

Munich, Germany

Siemens AILab Hackathon

2nd Winner

Nov. 2017

Munich, Germany

China National Scholarship

University of Electronic Science and Technology of China

Sep. 2016

Chengdu, China

Excellent Bachelor Thesis Award

Southwest University for Nationalities

Jun. 2016

Chengdu, China

Best University Graduates Award

Sichuan Province

Jan. 2016

Chengdu, China

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| Outstanding Student Scholarship <i>Southwest University for Nationalities</i> | Nov. 2015 <i>Chengdu, China</i> |
| Annual Excellent Student Innovative Project <i>Southwest University for Nationalities</i> | Jun. 2015 <i>Chengdu, China</i> |
| Sichuan Province Computer Production Competition <i>2nd Award</i> | May 2015 <i>Chengdu, China</i> |
| China National Scholarship <i>Southwest University for Nationalities</i> | Sep. 2014 <i>Chengdu, China</i> |
| Meritorious Winner in American Mathematical Contest in Modeling (MCM' 14) <i>Southwest University for Nationalities</i> | Apr. 2014 <i>Chengdu, China</i> |

TEACHING EXPERIENCE

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|---|--|
| Lecture Computer Graphics <i>As teaching assistant and instructor at LMU Munich. For B.Sc. students, approx. 200 students each year.</i> <i>Authored materials: https://changkun.de/s/teach/cg</i> | 2020/2021/2022 <i>Summer</i> |
| Practical Geometry Processing <i>As lecturer and instructor at LMU Munich. For M.Sc. students, 6 students each year.</i> <i>Authored materials: https://changkun.de/s/teach/gp</i> | 2020/2021 <i>Winter</i> |
| Lecture Information Visualization <i>As teaching assistant at LMU Munich. For M.Sc. students, approx. 100 students.</i> <i>Authored materials: https://changkun.de/s/teach/iv</i> | 2021 <i>Winter</i> |
| Lecture Online Multimedia <i>As teaching assistant and guest speaker at LMU Munich. For M.Sc. students, approx. 180 students.</i> <i>Authored materials: https://changkun.de/s/teach/omm</i> | 2019 <i>Winter</i> |
| Seminar Advances in Computer Graphics <i>As event organizer and supervisor at LMU Munich. For M.Sc. students, 6 students.</i> | 2019 <i>Winter</i> |
| Seminar Advanced Media Informatics <i>As supervisor at LMU Munich</i> | 2019/2021 <i>Summer/Winter</i> |
| Lecture Deep Learning and Artificial Intelligence <i>As student tutor at LMU Munich.</i> <i>Authored manuscripts: https://changkun.de/s/teach/dl</i> | 2018 <i>Winter</i> |
| Lecture Machine Learning <i>As student tutor at LMU Munich.</i> <i>Authored manuscripts: https://changkun.de/s/teach/ml</i> | 2018 <i>Summer</i> |
| Lecture Human-computer Interaction <i>As student tutor at Southwest University for Nationalities.</i> | 2015 <i>Summer</i> |
| Theses/Seminars Supervision <i>As supervisor</i> | 2020/2021/2022 |
| <ul style="list-style-type: none"> ◦ Bachelor Thesis: 2022. Shiyi Gou. <i>Exploring, Assisting, and Improving Human Rationality using Computational Approaches.</i> ◦ Master Thesis: 2022. Johannes Merkt. <i>Procedural Modeling with Nodes.</i> ◦ Master Thesis: 2022. Kehong Deng. <i>High Dimensional Trajectory Data Interpretation and Visualization.</i> ◦ Bachelor Thesis: 2022. Nicolas Mogenicato. <i>On-the-fly Mesh Streaming.</i> ◦ Bachelor Thesis: 2022. Benjamin Sühling. <i>Mesh Repairing using Deep Networks.</i> ◦ Bachelor Thesis: 2022. Zihan Kong. <i>Real Time Ray Tracing using Generative AI.</i> ◦ Bachelor Thesis: 2022. Gerhard van Nooy. <i>PAppearance-preserving Mesh Processing in Hierarchical Networks.</i> ◦ Master Thesis: 2021. Kevin Nsieyanji. <i>Scheduling, Profiling and Optimizing Hybrid Renderer.</i> ◦ Bachelor Thesis: 2021. Feng Chen. <i>Exploiting Human Preferences with Reinforcement Learning Approaches.</i> ◦ Master Seminar: 2021. Darina Cvetanova. <i>Recent Advances in Neural Rendering for 3D Applications.</i> ◦ Bachelor Thesis: 2021. Julius Girbig. <i>Automated Facial Rig Registration for Motion Capture.</i> Cosupervision: Prof. Dr. Sylvia Rothe. | |

- **Bachelor Thesis:** 2021. Oliver Möller. *Web User Interface Optimization from Preferential Ratings*.
- **Bachelor Thesis:** 2021. Christian Schmidt. *Progressive BVH Refinement in Interactive Ray Tracing*.
- **Master Thesis:** 2021. Elena Liebl. *Evaluating Human Expertise in 3D Model Simplification*.
- **Master Thesis:** 2021. Samuel Eiler. *Meshless Neural Rendering*.
- **Master Seminar:** 2020. Maksimilians Verbickis *Understanding and Evaluating Human Preferences in 3D Modeling*.
- **Master Seminar:** 2020. David Dodel, Ofek Lewinsohn. *Geometric Processing in Learning*. Cosupervision: Dennis Dietz.
- **Master Seminar:** 2020. Felix Dietz, Daniel Neumann. *Reinforcement Learning in Physics-based Simulation*. Cosupervision: Dennis Dietz.
- **Master Seminar:** 2020. Cecilia Thümmler. *Human Perception and Preference in 3D Modelling*.

PUBLICATIONS

Proceedings

- **Changkun Ou**, Andreas Butz. 2022. *Expertise in the Loop Considered Harmful? Human Satisficing is Sufficient to Support Machine Maximizing*. Under review in RecSys '22: 16th ACM Conference on Recommender Systems. ACM, New York, NY, USA, 17 pages.
- **Changkun Ou**, Daniel Buschek, Sven Mayer, Andreas Butz. 2022. *The Human in the Infinite Loop: A Case Study on Revealing and Explaining Human-AI Interaction Loop Failures*. In Mensch und Computer 2022 (MuC'22). ACM, New York, NY, USA, 14 pages.
- **Changkun Ou**, Daniel Buschek, Malin Eiband, Andreas Butz. 2021. *Modeling Web Browsing Behavior across Tabs and Websites with Tracking and Prediction on the Client Side*. arXiv preprint. 10 pages. <https://arxiv.org/abs/2103.04694>.
- Kai Holländer, Luca Schellenberg, **Changkun Ou**, and Andreas Butz. 2020. *All Fun and Games: Obtaining Critical Pedestrian Behavior Data from an Online Simulation*. In Extended Abstracts of the 2020 CHI Conference on Human Factors in Computing Systems (CHI EA '20). ACM, New York, NY, USA, 9 pages. <https://doi.org/10.1145/3334480.3382797>
- **Changkun Ou**, Yifei Zhan, Yaxi Chen. 2019. *Identifying Malicious Players in GWAP-based Disaster Monitoring Crowdsourcing System*. In the 2nd International Conference on Artificial Intelligence and Big Data (ICAIBD). IEEE. New York, NY, USA, 10 pages. 🏆 **Best Paper Award**. <https://doi.org/10.1109/ICAIBD.2019.8836972>

Books

- **Changkun Ou**. 2023. *The Elements of Go: Under the Hood*. To appear in Posts & Telecom Press. <https://golang.design/under-the-hood/>
- Quancheng Rao, **Changkun Ou**. 2022. *The Handbook of Go Programming Interviews*. China Machine Press. ISBN: 9787111702429. <https://golang.design/go-questions>
- **Changkun Ou**. 2021. *Modern C++ Tutorial: C++11/14/17/20 On the Fly*. In GitHub. 89 pages. <https://changkun.de/modern-cpp>

Articles

- Yaxi Chen, **Changkun Ou**. 2016. *Combining Touch Biometrics and Motion Sensors for Hand Posture Recognition and User Authentication System*. In Journal of Southwest University for Nationalities (Nature Science Edition). 7 pages. <https://doi.org/10.11920/xnmdzk.2016.04.011>
- Yaxi Chen, **Changkun Ou**, Zhaoyang Guo. 2014. *Space interactions based on monocular vision and simple gestures*. In Journal of Southwest University for Nationalities (Natural Science Edition). 6 pages. <https://doi.org/10.3969/j.issn.1003-4271.2014.06.13>

Technical Reports

- **Changkun Ou**. 2021. *(Generic) Functional Options Pattern*. In the golang.design Research. 10 pages. <https://golang.design/research/generic-option.pdf>
- **Changkun Ou**. 2021. *The Ultimate Channel Abstraction*. In the golang.design Research. 14 pages. <https://golang.design/research/ultimate-channel.pdf>
- **Changkun Ou**. 2021. *A Concurrent-safe Centralized Pointer Managing Facility*. In the golang.design Research. 14 pages. <https://golang.design/research/cgo-handle.pdf>
- **Changkun Ou**. 2021. *Scheduling Function Calls with Zero Allocation*. In the golang.design Research. 17 pages. <https://golang.design/research/zero-alloc-call-sched.pdf>
- **Changkun Ou**. 2020. *Pointers Might Not be Ideal as Arguments*. In the golang.design Research. 10 pages. <https://golang.design/research/pointer-params.pdf>
- **Changkun Ou**. 2020. *Eliminating A Source of Measurement Errors in Benchmarks*. In the golang.design Research. 10 pages. <https://golang.design/research/bench-time.pdf>

Miscellaneous

- Julius Girbig, **Changkun Ou**, and Sylvia Rothe. 2022. *Generative 3D Animation Pipelines: Automating Facial Retargeting Workflows*. In Workshop on “AI-Generated Characters: Putting Deepfakes to Good Use” of CHI '22: ACM CHI Conference on Human Factors in Computing Systems. New Orleans, LA, USA, 4 pages. <https://changkun.de/paper/deepfake.pdf>
- Jingyi Li, **Changkun Ou**, Yong Ma. 2019. *Cultivation and Incentivization of HCI Research and Community in China: Taxonomy and Social Endorsements*. In Workshop on “HCI in China: Research Agenda, Education Curriculum, Industry Partnership, and Communities Building” of the 2020 CHI Conference on Human Factors in Computing Systems (CHI EA '19). Glasgow, UK, 7 pages. <https://changkun.de/paper/china.pdf>
- **Changkun Ou**. 2018. *An Introduction to Recent Mobile Affective Inference Techniques: Methods, Applications and Challenges*. In Advanced Seminar Media Computer Science, LMU Munich. 9 pages. <https://changkun.de/paper/emotions.pdf>
- Matthias Geiger, **Changkun Ou**, Cedric Quintes. 2017. *WatchOut: A Road Safety Extension for Pedestrians on a Public Windshield Display*. arXiv preprint. 5 pages. <https://arxiv.org/abs/1905.05390>
- **Changkun Ou**, Mu Huang, Mengxin Shi, Jiang Cheng. 2014. *A Study in Keep-Right-Except-To-Pass Rule*. In the Mathematical Contest in Modeling. 35 pages. 🏆 **Meritorious Winner** <https://changkun.de/paper/keepright.pdf>

Presentations

- Changkun Ou. 2022. *The Decision Maker's Dilemma: or how I stopped struggling with possible choices*. LMU Munich Internal Doctoral Colloquium. Chiemsee, Germany. <https://changkun.de/talk/dilemma.pdf>
- Changkun Ou. 2022. *Generics in Go 1.18*. The TalkGo Meetup. Virtual Event. <https://changkun.de/talk/generics118.pdf>
- Changkun Ou. 2022. *What is A Rational Community Discussion?* The TalkGo Meetup. Virtual Event. <https://changkun.de/talk/rational.pdf>
- Changkun Ou. 2021. *Can we compute the free-will?* LMU Munich Internal Doctoral Colloquium. Venice, Italy. <https://changkun.de/talk/polyred6fold.pdf>
- Changkun Ou. 2021. *Delicate Dance: Preferences in Interactive Meshing*. LMU Munich Internal Doctoral Colloquium. Virtual Event. <https://changkun.de/talk/polyred5star.pdf>
- Changkun Ou. 2020. *A Future of Polygon Reduction*. LMU Munich Internal Doctoral Colloquium. Venice, Italy. <https://changkun.de/talk/polyred4us.pdf>
- Changkun Ou. 2020. *Reliable Benchmarking*. The TalkGo Meetup. Virtual Event. <https://changkun.de/talk/gobench.pdf>
- Changkun Ou. 2020. *Go 2 Generics? A (P)review*. The TalkGo Meetup. Virtual Event. <https://changkun.de/talk/go2generics.pdf>
- Changkun Ou. 2020. *A Study on Go Timer Implementation*. The TalkGo Meetup. Virtual Event. <https://changkun.de/talk/timer.pdf>
- Changkun Ou. 2019. *Technological Outlook*. Lecture Online Multimedia. Munich. <https://changkun.de/talk/omm9.pdf>
- Changkun Ou. 2019. *Understanding Communicating Sequential Processes*. The TalkGo Meetup. Virtual Event. <https://changkun.de/talk/csp.pdf>
- Changkun Ou. 2019. *Simplicity is complicated: On the balance of performance and knobs*. LMU Munich Internal Doctoral Colloquium. Vienna, Austria. <https://changkun.de/talk/polyred2what.pdf>
- Changkun Ou. 2019. *Real-world Go Concurrency Bugs*. The TalkGo Meetup. Virtual Event. <https://changkun.de/talk/bug.pdf>
- Changkun Ou. 2019. *Internals of Channel and Select in Go*. The TalkGo Meetup. Virtual Event. <https://changkun.de/talk/channel.pdf>
- Changkun Ou. 2019. *Identifying Malicious Players in GWAP-based Disaster Monitoring Crowdsourcing System*. ICAIBD. Chengdu, China. <https://changkun.de/talk/gwap.pdf>
- Changkun Ou. 2019. *A Glimpse to the Advances of Mesh Representation Learning*. Internal Doctoral Colloquium Spring. Bernried, Germany. <https://changkun.de/talk/polyred1step.pdf>
- Changkun Ou. 2019. *Understanding and Predicting User Browsing Behavior*. Masters Defence Presentation. Munich, Germany. <https://changkun.de/talk/master.pdf>
- Changkun Ou. 2018. *On the development of Quantified UX Metric*. Design Workshop II, LMU Munich. Munich, Germany <https://changkun.de/talk/qux.pdf>
- Changkun Ou. 2018. *Capsule Network with Routing Mechanism*. Advanced Seminar Deep Learning, LMU Munich. Munich, Germany. <https://changkun.de/talk/capsnet1.pdf>, <https://changkun.de/talk/capsnet2.pdf>

- Changkun Ou. 2018. *Understanding Generalization in Deep Learning*. Advanced Seminar Deep Learning, LMU Munich. Munich, Germany. <https://changkun.de/talk/generalization.pdf>
- Hermann Redich, Patrick Börzel, Isabella Galter, Collin Leiber, Changkun Ou. 2018. *Convolutional Neural Networks from Zero to Hero*. Advanced Seminar Deep Learning, LMU Munich. Munich, Germany. <https://changkun.de/talk/cnn.pdf>
- Changkun Ou. 2016. *Mathematical Modeling Tutorial*. TouTube. Virtual Events. <https://changkun.de/s/playlist/math-modeling>

Theses

- **Changkun Ou.** 2019. *Understanding and Predicting Web Browsing Behavior*. In the Institute of Computer Science. LMU Munich. 70 pages. **Master Thesis.** <https://changkun.de/thesis/master.pdf>
- **Changkun Ou.** 2016. *Designing Alternative Contact-free Control Modalities for Smart Watches*. In the Institute of Computer Science and Engineering. Southwest University of Nationalities. 47 pages. **Bachelor Thesis.** 🏆 **Excellent Bachelor Thesis.** <https://changkun.de/thesis/bachelor.pdf>

OTHER ACTIVITIES

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|---|-------------------------|
| Reviewing <i>The ACM CHI Conference on Human Factors in Computing Systems</i> | CHI '20 - CHI'22 |
| Reviewing <i>IFIP TC13 International Conference on Human-Computer Interaction</i> | INTERACT' 2021 |
| Student volunteer <i>The ACM CHI Conference on Human Factors in Computing Systems</i> | 2020 |
| Student volunteer <i>Conference Smart Graphics 2015</i> | Aug. 2015 |