Congyu Zou, Ph.D. (Student)

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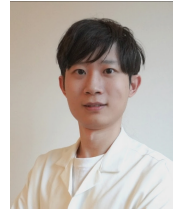
Employment History

04.2020 – 03.2024

Rechts der Isar Hospital of the Technical University of Munich.
AI Researcher & IT
Leading and executing advanced research in Artificial Intelligence(AI) plus ECG, focusing on feature-based machine learning, computer vision, signal processing, **deep learning**, **self-supervised learning**, **active learning**. Responsible for constructing and sustaining robust hardware infrastructure while addressing IT issues, developing an efficient data pipeline, and crafting prototype demos for telemedical software applications.

03.2019 – 03.2020

Building Radar GmbH.
Machine Learning Engineer.
Designing and developing advanced machine/deep learning algorithms for **Natural Language Processing (NLP)** challenges. Deploying cloud-based Machine Learning services, ensuring seamless integration. Executing a broad spectrum of **Data Engineering** tasks: data wrangling, cleaning, preprocessing, database maintenance, data analysis, error analysis, and data augmentation. Developing **web crawlers** for efficient data collection and analysis.

12.2017 – 06.2018

BMW AG.
Algorithm Developer (Master Student).
Topic: Commonality optimization in the field of Crashworthiness Goal: Find the best configuration that is economical and safe. Method: **Genetic algorithm** and **Monte Carlo Tree Search** (same as Alpha-GO)

07.2017 – 11.2017

peopleForecast GmbH.
Data Scientist (Working Student).
Analyzing datasets of millions of records primarily using **R** and Excel. Employing machine learning techniques for data analysis. Developing a crawler integrated with **MongoDB** using Python.

02.2014 – 03.2014

Hangwan Techology Ltd.
Math working student.
Participated in the air cleaner team, utilizing **C language** to compute the optimal length of the dust absorption board.

Education

04.2020 – Now

Ph.D., Technische Universität München(TUM) Department of Signal processing.
Thesis in processing: *Application of artificial intelligence in the field of ECG analysis.*
Supervisor: Prof. Utschick Wolfgang.

Education (continued)

10.2015 – 10.2018   **M.Sc.**   **Applied Mathematics in Operations research, TUM** Department of Mathematics.
Thesis title: *Commonality Optimization in the Field of Chrashworthiness..*
Key courses: mathematic optimization and algorithm design (inklu. nonlinear optimization, discrete optimization, game theory); data science (incl. machine learning, data mining); computer science; artificial intelligence

10.2011 – 09.2015   **Bachelor of Information and Computational Science, Beihang University** Department of Mathematics
Thesis title: *Optimizing Hyper-Spherical Packing within Hyper-Rectangular Spaces: A Comprehensive Methodological Approach.*
Key courses: advanced mathematics; mathematic optimisation; data science; computer science; system science and control theory.

Research Publications

Journal Articles

1 C. Zou, A. Müller, U. Wolfgang, *et al.*, "Heartbeat classification by random forest with a novel context feature: A segment label," *IEEE Journal of Translational Engineering in Health and Medicine*, vol. 10, pp. 1–8, 2022. DOI: 10.1109/JTEHM.2022.3202749.

Conference Proceedings

1 C. Zou, A. Muller, E. Martens, *et al.*, "Self-supervised learning for atrial fibrillation detection with ecg using cnntransformer," in *2023 IEEE International Conference on Bioinformatics and Biomedicine (BIBM)*, Los Alamitos, CA, USA: IEEE Computer Society, Dec. 2023, pp. 807–812. DOI: 10.1109/BIBM58861.2023.10385550.

2 C. Zou, M. Djajapermana, E. Martens, *et al.*, "Dwt-cnntrn: A convolutional transformer for ecg classification with discrete wavelet transform," in *2023 45th Annual International Conference of the IEEE Engineering in Medicine Biology Society (EMBC)*, 2023, pp. 1–6. DOI: 10.1109/EMBC40787.2023.10340561.

3 P. Müller, G. Kaissis, C. Zou, and D. Rueckert, "Joint learning of localized representations from medical images and reports," in *Computer Vision – ECCV 2022*, Springer Nature Switzerland, 2022, pp. 685–701, ISBN: 9783031198090. DOI: 10.1007/978-3-031-19809-0_39.

4 P. Müller, G. Kaissis, C. Zou, and D. Rueckert, "Radiological reports improve pre-training for localized imaging tasks on chest x-rays," in *Medical Image Computing and Computer Assisted Intervention – MICCAI 2022*, L. Wang, Q. Dou, P. T. Fletcher, S. Speidel, and S. Li, Eds., Cham: Springer Nature Switzerland, 2022, pp. 647–657, ISBN: 978-3-031-16443-9.

Skills

Languages	Chinese (Mother Tongue), Very good English(IETLS 6.5), Good German (DSH-2)
Coding	Python, MATLAB, C, C#, C++, Java, PHP, R, SQL, XML/XSL, LaTeX, …
Databases	MySQL, SQLite, MongoDB, Redis, Hadoop
Web Dev	HTML, CSS, JavaScript, React
Misc.	Linux, MS office, PowerBI(Bussiness Analysis), LaTeX, teaching

Miscellaneous Experience

Awards and Achievements

2020   📕 **Silver Employee**, Authorized by: Building Radar GmbH. Award to the best Employee of the season.

2018   📕 **MAKE prize**, Authorized by: Siemens Healthineers, UnternehmenTUM. Award to the team build the best start-up business prototype in a tech challenge event.

2017   📕 **Techfest Runner-up**, Authorized by: Siemens, UnternehmenTUM. Award to the team build the second best APP prototype in a tech challenge.

2015   📕 **Outstanding graduate**, Authorized by: Beihang University.

Certification

2016   📕 **Certified Vice-chief**. Awarded by Chinese student and scholar association in Munich(CSSAM) for organising events and serving the students.

References

"A talented person full of passion and multiple skills, a fast learner with great curiosity"

- an old friend who is working in **Beihang University**.

"He is such a genius guy, it is quite a pleasure to work with him. "

- a friend/colleague who is working in **Meta**.