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Kai Zhao

Education

Technical University of Darmstadt – Msc. Medical Technology (focus on AI technology and Computer science)

04/2022 - Current

Technical University of Darmstadt – Preparatory Semester for Msc. Electrical Engineering and Information Technology

04/2021 - 03/2022

Technical University of Dresden – Preparatory Course for DSH

10/2020 - 03/2021

Beijing University of Chinese Medicine (Beijing, China) – Master of Medicine, Chinese Medicine

09/2017 - 06/2020

Health break and preparation for postgraduate entrance exams in China

06/2014 - 06/2017

Hefei University of Technology (Hefei, China) – B.Eng. Automation

09/2009 - 06/2013

Work Experience

Rosenpark Research GmbH (Darmstadt, Germany) – Working Student in Data Analysis

02/2024 - 07/2024

- Data analysis and evaluation of medical data using Python and Excel

Department of Mathematics at the Technical University of Darmstadt – Student Assistant for C++ Course

04/2023 - 07/2023

- Supervision of exercise group for the course 'Introduction to Programming II C++"

Custom Interactions GmbH (Darmstadt, Germany) — Working Student for User Experience

11/2022 - 02/2023

- Junior User Experience Researcher for Emergency Room Monitoring Systems

World Science and Technology (Beijing, China) — Internship as Editor for Scientific Journals

08/2020 - 09/2020

- Responsible for reviewing scientific articles in the field of medicine

Cheng Dao Zhi Ji Technology Co.,Ltd (Beijing, China) — Student Assistant for Chinese Medicinal Preparations

06/2020 - 08/2020

- Development of a research plan for Chinese medicine

Outpatient Clinic of the National Chinese Medicine Department at BUCM — Medical Assistant-Concurrent Internship

09/2018 - 01/2020

- Assisted with input and compilation of prescriptions by the physician; organized the clinical workflow for patients

Hefei Hengda Jianghai Pump CO.LTD By Shares (Hefei, China) — Production Internship

07/2013 - 10/2013

- Involving in the productive process of pump electromotor; Assistant in the purchasing department.

PUBLICATIONS

[1] Study and Implementation on Knowledge Graph of Guizhi Decoction Associated Formulas Based on Neo4j. **Zhao Kai**, Shi Na, Sa Zhen, Wang Huaxing, Xu Xiaoying. World Chinese Medicine, 2019, 14(10): 2636-2639+2646. (**Included in CNKI Academic Abstracts (2023.09-10) as high-ranking PCSI articles, highly cited articles, and highly downloaded articles.**)

[2] Text mining and analysis of treatise on febrile diseases based on natural language processing. **Zhao Kai**, Shi Na, Sa Zhen, Wang Huaxing, Lu Chunhua, Xu Xiaoying. World J Tradit Chin Med, 2020, 6: 67-73.

[3] Mechanisms of Dachaihu Decoction in Treatment of Type 2 Diabetes Based on Network Pharmacology. **Zhao Kai**, Xu Xiaoying. Modernization of Traditional Chinese Medicine and Materia Materia-World Science and Technology, 2020, 22(09): 3225-3234.

[4] Systematic Pharmacological Study on Dahuang Huanglian Xiexin Decoction on Helicobacter Pylori Infection. Lu Chunhua, **Zhao Kai**, Sa Zhen, Wang Huaxing, Xun Caimeng, Gao Xue, Liu Yansong, Lu Tao. World Chinese Medicine, 2020, 15(12): 1699-1704.

PROJECTS

Ongoing Master's Thesis: Enhancing NLI for Biomedical Applications using LLMs

12/2024 – Current

Under the Department of Computer Science, Technical University of Darmstadt.

- Conducting advanced research on optimizing LLMs for biomedical semantic reasoning tasks through cost-efficient and robust methods leveraging multi-agent frameworks and prompt engineering strategies.

Development of Medical AI-Agents QA System

10/2024 – 11/2024

- Developed a medical ai-agents question-answering system by fine-tuned using LoRA and PEFT framework for domain-specific adaptation.
- Built a RAG system integrating FAISS vector database and Sentence Transformers for text vectorization and similarity search.
- Designed a Multi-Agent collaborative architecture using the LangChain and Hugging Face Transformers.

Semi-Automatic Tool for Annotating Large-Scale 3D Assets

10/2023 – 09/2024

One year Project in the department of Computer Science, Technical University of Darmstadt

- Developed a semi-automatic tool for annotating large-scale 3D assets from RGB videos, using NeRF, SA3D, and SAM2
- Our approach effectively generates accurate 3D meshes while reducing manual effort

Effect of Melatonin Combined with Yupingfeng Powder on Immune Function in Elderly Rats Under Sudden Temperature Changes

09/2018 – 05/2020

Scientific Research Development Fund Project of Beijing University of Chinese Medicine

- Independently designed, executed, and completed the project under the guidance of my supervisor
- Responsibilities included developing the experimental protocol, conducting the experiment, analyzing data using SAS
- Writing the final project report and research papers

LANGUAGE SKILLS

English - TOEFL iBT 89 | German - DSH2