MA Qi

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Work Experience

Zhejiang University Cognomics Lab | Research Assistant | PI: Kong, X. Z. Jul 2025–Oct 2026

Conducted interdisciplinary research at the intersection of cognitive neuroscience and artificial intelligence, with a focus on brain hemispheric lateralization.

Education

Heidelberg University | M.A. in Computational Linguistics Oct 2026–Present

Zhejiang University | Bachelor of Science in Psychology | Hangzhou, Zhejiang Sep 2021–Jul 2025

Research Experience

Reconstruction-Derived Specificity in Schizophrenia Jun 2026–Present

Cognomics Lab
PI: Kong, X. Z.

- **Research Overview:** Analyze structural MRI data from 948 participants across five sites to investigate cross-hemisphere reconstruction-derived neuroanatomical specificity (ANS/RNS) in schizophrenia.
- **Research Highlights:**
  - **Multiscale group comparisons:** Test whether ANS/RNS differ between patients with schizophrenia and healthy controls across spatial scales.
  - **Clinical and cognitive associations:** Examine associations between ANS/RNS and clinical/cognitive measures to assess the phenotypic relevance of reconstruction-derived metrics.
  - **Disease classification:** Evaluate whether ANS/RNS features can distinguish patients with schizophrenia from healthy controls.
- **Manuscript:** In preparation.

Reconstruction-Derived Specificity and Handedness Oct 2024–Present

Cognomics Lab
PI: Kong, X. Z.

- **Research Overview:** Used handedness as a behavioral lateralization phenotype to test whether cross-hemisphere reconstruction residuals capture handedness-related structural information beyond conventional gray-matter volume asymmetry indices.
- **Research Highlights:**
  - **Cross-hemisphere reconstruction:** Reconstructed each hemisphere from its contralateral counterpart via a deep generative network (DGN), quantifying original-to-reconstructed residuals as absolute and relative neuroanatomical specificity (ANS/RNS).
  - **Global specificity and validation:** Captured whole-hemisphere structural relationships via reconstruction residuals beyond homologous-region comparisons; evaluated anatomical plausibility, individual specificity, test–retest reliability, and hemisphere-identity classification.
  - **Handedness analysis:** Benchmarked ANS and RNS against a conventional gray-matter volume asymmetry baseline in the balanced AOMIC Hand190 cohort; RNS achieved a mean AUC of 0.624, significantly outperforming the 0.539 baseline ($p = 0.018$).
- **Manuscript Draft:** Led preparation of the English manuscript draft, *Reconstruction-derived hemispheric specificity captures distributed structural information related to handedness*.

Project Experience

HemiSpec: Hemispheric Specificity Toolkit | HemiSpec May 2026–Present

- **Project Overview:** Packaged the cross-hemisphere DGN and ANS/RNS framework into installable software for generating bilateral specificity maps from standardized gray-matter images, running ROI and validation analyses, and integrating outputs into downstream neuroimaging studies.
- **Technical Highlights:**
  - **Workflow integration:** Integrated FSL gray-matter preprocessing, bidirectional DGN reconstruction, ANS/RNS calculation, ROI export, and hemisphere-classification validation in one workflow.
  - **Reusable interfaces:** Developed a Python API, CLI, and GUI for batch generation of specificity maps, ROI tables, and optional validation outputs.
  - **Software delivery:** Delivered source-install instructions, bilingual documentation, and pytest regression tests; documented input requirements, model dependencies, and outputs.

Laboratory Computing Cluster Deployment & Operations Jun 2026–Oct 2026

- **Identity migration:** Advanced the lab's user-management migration from legacy NIS to FreeIPA.
- **Client migration:** Moved the management host of 3 Linux clients from CentOS to Rocky OS.
- **Compute scheduling:** Contributed to deployment and acceptance of the lab Slurm cluster; validated regular-user CPU batch jobs, GPU resource requests, interactive jobs, job cancellation, and input/output file transfers.
- **Operational handover:** Established account-provisioning, group-permission, and temporary-credential delivery procedures; authored FreeIPA first-login and admin guides plus Slurm user and admin manuals.

Cortical & Subcortical Visualization Codex Skills | Cortex & Subcortex May 2026–Aug 2026

- **Project Overview:** Packaged cortical and subcortical ROI-table visualization workflows into Codex Skills, enabling AI-agent-driven figure generation via natural language and reducing repeated tutorial lookups and ad hoc scripting.
- **Technical Highlights:**
  - **AI-agent interaction:** Designed reusable workflows for natural-language-guided atlas selection, figure generation, and result presentation.
  - **Cortical workflow:** Leveraged ggseg/ggseg3d to support visualization across multiple cortical atlases.
  - **Subcortical workflow:** Integrated Annie Bryant's *subcortex_visualization* to generate 2D maps of subcortical structures (including the thalamus), the cerebellum, and the brainstem.

Building a Language Model from Scratch | LoreWormGu Dec 2024–Mar 2025

- **Project Overview:** Built a tens-of-millions-parameter language model from scratch, implementing an end-to-end training pipeline across pretraining, supervised fine-tuning (SFT), and R1 distillation.
- **Technical Highlights:**
  - **Architecture and tokenizer:** Implemented a Llama 3-style architecture with RMSNorm, configurable key/value heads, SwiGLU, and RoPE, alongside a Chinese BBPE tokenizer.
  - **Pretraining and optimization:** Pretrained the model on the Jiangshu dataset with custom token-level loss, forward passes, gradient accumulation, and mixed precision.
  - **SFT and R1 distillation:** Curated open-source instruction data for SFT and performed response-based distillation using DeepSeek-R1 outputs.

N-back Working-Memory Load Classification | DecodeWM Jun 2023–Sep 2023

- **Course project:** Classified 0-back vs. 2-back working-memory states from HCP task-fMRI ROI features using logistic regression and random forests in the Neuromatch Academy computational neuroscience course.

Science Communication

A Man's Brainhole | WeChat Official Account Jun 2026–Present

- **Editorial work:** Write Chinese-language explainers on brain science, computational neuroscience, NeuroAI, and research tools by curating papers and unpacking their methods and findings.
- **Production and quality control:** Leverage AI-assisted workflows for literature review, figure curation, typesetting, and publishing while verifying sources, terminology, and quantitative claims and communicating limitations.
- **Audience growth:** Published **100+ articles** and gained **1,000+ new followers**.

Skills & Languages

Skills: C, Python, machine learning and deep learning, probability and statistics, structural neuroimaging processing and visualization, Linux, Slurm.
TOEFL iBT: 5/6 (100/120).