

# CHANG ZENG

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## EDUCATION

UNIVERSITY OF MASSACHUSETTS AMHERST

Amherst, MA

*Ph.D in Computer Science, Mater of Science with Bays State Fellow*

Sep 2022 - Present

## TECHNICAL SKILL

- **Programming Languages:** Python, Go, C#, TypeScript, C++
- **Library & Framework:** TensorFlow, PyTorch, NumPy, Pandas, Docker
- **Tools:** Git, Kubernetes, Docker, AWS, Unix/Linux, Node.js, PostgreSQL, Machine Learning Models

## EXPERIENCE

FAIRNESS METRICS AND COMPLEXITY ANALYSIS

Amherst, MA

**Research Assistant (Theory, Optimization, Fairness Elicitation)**

Sep 2022 - Present

- Modeled human and AI decision-making processes by analyzing the behavior of the **Weighted Generalized Means** class in real-world scenarios involving multiple stakeholders.
- Created flexible, robust distance **metrics** to quantify **fairness disparities** by comparing utility and disutility outcomes among diverse stakeholder groups.
- Conducted **minimax complexity analysis** to evaluate the **efficiency** of the designed algorithm for **proper and improper epsilon-elicitation** of fairness concepts.

X-CAMP TECH TEAM INTERN

Remote, US

**Software Engineer (Go, Git, Test&Debug, CI/CD, Kubernetes, Docker)**

Jun 2023 - Aug 2024

- Designed a **scalable Golang architecture** integrating the Zoom API, **automating manual processes** for over 1000 users and reducing operational time from 2 hours to a few seconds, significantly improving efficiency.
- Utilized an automated **CI/CD** workflow for building and deploying to a remote **Kubernetes** cluster, facilitating seamless service scaling and management in a **containerized** environment.
- Developed a **multi-language tokenizer** capable of processing both natural and programming languages, enabling accurate similarity checks between content containing Chinese, English characters, and code blocks.
- Implemented advanced data structures, including **Bloom and Cuckoo filters**, reducing cache data storage space by 60%, optimizing system performance.

AUTOENCODER OPTIMIZATION

Amherst, MA

**Software Engineer (Python, Deep Learning, MLP, CNN, RNN)**

Sep 2022 - Dec 2023

- Built an **autoencoder** using backpropagation to denoise electrocardiogram signals, significantly improving signal quality and diagnostic accuracy.
- Performed a comprehensive comparison between linear and non-linear structures, including **CNN** and **RNN**, to evaluate their performance in optimizing the denoising process.
- Employed academic research methodologies to methodically **fine-tune** autoencoder model parameters, incorporating strategies like **scheduled learning rate** adjustments and varied layer structures, resulting in elevated denoising capabilities and heightened accuracy.

FACIAL ACTIVITY TRACKING

Amherst, MA

**Software Engineer (Python, Machine Learning, OpenCV, CUDA)**

Jan 2022 - May 2022

- Utilized **BERT transformer** (TensorFlow) along with **sampling methods** such as random forests and stratified cross-validation to accurately classify facial behavior patterns.
- Utilized **OpenCV** libraries to capture and process live camera feed in real-time, extracting relevant features from the eye images, such as pupil dilation and eye movement, to analyze and determine the user's eye activity.