KALVIN CHANG

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EDUCATION

University of California, Berkeley *Berkeley, CA*
Doctor of Philosophy in Computer Science *Aug 2025 - present*
Advisor: Alane Suhr
Selected courses: Data-Centric LLMs, Large-Scale Vision-Language & Action Models

Carnegie Mellon University (CMU) *Pittsburgh, PA*
Master of Science in Language Technologies, School of Computer Science *May 2023*
GPA: 4.28/4.33 (Rank: 1/18), Advisor: David Mortensen
Selected courses: Speech Processing, Multilingual NLP, Computational Ethics of NLP, ML for Structured Data (probabilistic graphical models), Phonetics & Phonemics, Phonology

Bachelor of Science in Computer Science *Dec 2021*
GPA: 3.67/4.0 (University Honors), Concentration in Human-Computer Interaction
Selected courses: Design & Analysis of Algorithms, Designing Human-Centered Software, Language Variation & Change, Language Diversity & Cultural Identity, Ethics & Policy of Computing

RESEARCH EXPERIENCE

Tencent AI Labs, Multimodal Understanding Team Bellevue, WA
AGI Research Intern, Supervisors: Dr. Dong Yu, Dr. Yiwen Shao *Mar 2025 - May 2025*

- Built a speech encoder with cross-dialect semantic alignment without paired translation data
- Trained a state-of-the-art Zipformer Chinese dialect ASR model with distributed training (32 GPUs)

CMU WAVLab & ChangeLingLab Pittsburgh, PA
Visiting Scholar, Advisors: Prof. Shinji Watanabe, Prof. David Mortensen *Aug 2024 - Feb 2025*

- Investigated speech in-context learning for low-resource ASR using insights from historical linguistics
- Training open source, Whisper-like speech foundation model for universal phone recognition, POWSM
- Secured a National Science Foundation grant ($1,000,000) involving the two techniques above
- Integrated a dataset of African American English into ESPnet for benchmarking pronunciation variation
- Probed how self-supervised speech models encode clusters of allophones (Choi *et al.* 2025)
- Created 3 linguistic datasets for an instruction tuning benchmark for speech LMs (Huang *et al.* 2025)

CMU Language Technologies Institute Pittsburgh, PA
Graduate Research Assistant, Advisor: Prof. David Mortensen *Jan 2022 - May 2023*

- Discovered bias in self-supervised speech models against African American English (Interspeech 2024)
- Collected Taiwanese corpus for end-to-end ASR with self-supervised speech features (ASRU 2023)
- Set state-of-the-art on protoform reconstruction with a Transformer encoder-decoder model (ACL 2023)
- Built a neural pipeline matching 87.6% of a linguist's language family tree (LChange 2023)
- Expanded open-source G2P package's coverage of 7 low-resource Chinese varieties, enabling the collection of 67,000+ pronunciations to address gap in comparative Chinese datasets (Coling 2022)
- Proposed metric learning & masked LM for learning phonetic word embeddings (LREC-Coling 2024)

Amazon Web Services, Responsible AI Team Seattle, WA
Machine Learning Engineer Intern, Supervisor: Dr. Alicia Sagae *May 2022 - Aug 2022*

- Designed a phonetic feature space to cluster high error ASR utterances for debiasing, capturing phonetic (pronunciation) variation across regional dialects of English with wav2vec 2.0

PUBLICATIONS

[**ACL 2025**] A. Naik *et al. Programming by Example meets Historical Linguistics: A Large Language Model Based Approach to Sound Law Induction*

[**ICLR 2025**] C. Huang *et al. Dynamic-SUPERB Phase-2: A Collaboratively Expanding Benchmark for Measuring the Capabilities of Spoken Language Models with 180 Tasks.*

[**NAACL 2025**] K. Choi, E. Yeo, **K. Chang**, S. Watanabe, and D. Mortensen. *Leveraging Allophony in Self-Supervised Speech Models for Atypical Pronunciation Assessment.*

[**Interspeech 2024**] **K. Chang***, Y. Chou*, J. Shi, H. Chen, N. Holliday, O. Scharenborg, and D. Mortensen. *Self-supervised Speech Representations Still Struggle with African American Vernacular English.* **Honorable Mention, Special Session on Responsible Speech Foundation Models.**

[**IEEE ASRU 2023**] Y. Chou*, **K. Chang***, *et al. Evaluating Self-Supervised Speech Models on a Taiwanese Hokkien Corpus.*

[**ACL 2023**] Y.M. Kim*, **K. Chang***, C. Cui, and D. Mortensen. *Transformed Protoform Reconstruction.* **Oral Presentation.**

[**LChange 2023**] **K. Chang***, N. Robinson*, A. Cai*, T. Chen, A. Zhang, and D. Mortensen. *Automating Sound Change Prediction for Phylogenetic Inference: A Tukanoan Case Study.* **Oral Presentation.**

[**LREC-Coling 2024**] V. Zouhar*, **K. Chang***, C. Cui, N. Carlson, N. Robinson, M. Sachan, and D. Mortensen. *PWESuite: Phonetic Word Embeddings and Tasks They Facilitate.*

[**LREC-Coling 2024**] R. Shim*, **K. Chang***, and D. Mortensen. *Phonotactic Complexity across Dialects.*

[**Coling 2022**] **K. Chang**, C. Cui, Y.M. Kim, and D. Mortensen. *WikiHan: A New Comparative Dataset for Chinese Languages.*

* denotes equal contribution.

Under Review

Academic Service

Reviewer: NAACL 2025, *Speech Communication*

WORK EXPERIENCE

Amazon Web Services Seattle, WA
Software Development Engineer, Test Generation Team *Aug 2023 - Aug 2024*

· Experimented with prompt engineering (prompt chaining, few shot) for LLM-based test generation
· Created feedback loop to fix runtime errors with chain-of-thought, doubling number of executable tests
· Designed automatic evaluation suite for LLM-generated tests for 384 AWS services in an ECS container

Software Development Engineer Intern, EC2 Quality Team *Jun 2021 - Aug 2021*

· Implemented pagination & presigned URL for website diagnosing EC2 Instances during on-call
· Caught elusive bug in the AWS Java SDK with two SDK teams, leading to a bug fix

Cardinal Blue Software, Inc. Taipei, Taiwan
Server Developer Intern *Feb 2020 - Jul 2020*

· Transitioned PostgreSQL database to transactional pooling, increasing scalability 18-fold

AWARDS

Apple AI Residency, Finalist (80 / 6000) *Feb 2025*
Gates Cambridge Scholarship, University of Cambridge (35 / 600 U.S. recipients) *Jan 2025*
Honorable Mention, Responsible Speech Foundation Models, Interspeech *Sep 2024*
University Honors, Carnegie Mellon University *May 2022*
Dean's List with High Honors, CMU School of Computer Science *Fall 2020, Spring 2021, Fall 2021*

TEACHING EXPERIENCE

Teaching Assistant, Introduction to Machine Learning *Fall 2022*

· Developed coursework for 400+ students, which covered Hidden Markov Models and gradient descent

Teaching Assistant, Principles of Functional Programming *Fall 2019, Fall 2020*

· Held office hours and labs for 200-student course covering structural induction and higher order functions

ACTIVITIES

Researcher, SDAIA Winter School *Dec 2024*

· Selected to attend the inaugural winter school on multimodal LLMs, designed as an extension to JSALT
· Decreased WER on ASR for codeswitching using Whisper prompted with in-context learning

Leader, Computational Historical Linguistics Subgroup *Jan 2023 - May 2023*

· Recruited and led team of 6 towards publication on phylogenetic inference (Chang *et al.* 2023)
· Mentored 3 freshmen who were new to machine learning, deep learning, NLP, and research

The Impact Fellowship, Impact Labs *Jan 2019*

· Selective ($< 5\%$) two-week program to train software engineers working in tech for social good
· Connected with speakers and leaders from NGOs, social startups, and think tanks

Mentor, Glen A. Wilson High School CODE Team *2018 - present*

· Taught human-centered design, web dev (HTTP, API design) and data structures (big O, linked lists)
· Awarded one of two Leadership and Service Awards by Principal Dr. Danielle Kenfield
· Hosted Shark Tank to critique Congressional App Challenge ideas, emphasizing human-centered design
· Provided free college apps critiques, helping 2 high school students secure Amazon internships
· Encouraged students to find their interdisciplinary niche within CS (e.g. computational linguistics)
· Mentored twenty-five alumni across prestigious universities (e.g. Berkeley and Harvey Mudd)

TALKS

Neural Reconstruction of Middle Chinese, CMU Language Technologies Institute *May 3, 2023*
Computer Science After High School, Wilson Hacks, Glen A. Wilson CODE *Apr 1, 2023*

SKILLS

Software Engineering	Python, Java, Ruby, Go, C, AWS, HTML/CSS, JS, Git
Machine Learning Tools	PyTorch, ESPnet, fairseq, transformers, SLURM
Languages	English (native), Mandarin Chinese (native), Spanish (California Biliteracy Seal), Taiwanese Hokkien