

BURIN NAOWARAT

burin.naowarat@ed.ac.uk ◇ LinkedIn ◇ Github ◇ Google Scholar

RESEARCH INTERESTS

Interpretability; geometric analysis of emergent structure in neural latent spaces; speech and language representation learning; self-supervised learning.

EDUCATION

PhD in Informatics

Sep 2024 - Mar 2028 (*Expected*)

University of Edinburgh, Edinburgh, United Kingdom

- Studying geometric structure of representations in speech and language neural models.
- Supervised by Dr. Hao Tang and Dr. Sharon Goldwater

M.Eng. in Computer Engineering

Aug 2019 - Jun 2023

Chulalongkorn University, Bangkok, Thailand

- Thesis: Incorporating Context into Non-Autoregressive Models using Contextualized CTC for Sequence Labelling
- Introduced contextualized CTC loss as a novel training objective, enabling context-aware predictions that reduced labeling error rates over standard CTC baselines.
- Supervised by Dr. Ekapol Chuangsuwanich

B.Eng. in Computer Engineering (First Class Honors)

Aug 2015 - Jun 2019

Chulalongkorn University, Bangkok, Thailand

- Thesis: Automatic Speech Assessment for Thai Speech Disorders
- Designed and deployed a mobile pronunciation assessment system for Thai speech disorder patients, using Kaldi-based phoneme recognition and Thai phonology distance scoring.

PUBLICATIONS

- [1] **Burin Naowarat**, Hao Tang, and Sharon Goldwater. A framework for analyzing concept representations in neural models. In *CoNLL*, 2026.
- [2] **Burin Naowarat**, Philip Harding, Pasquale D'Alterio, Sibongiso Tong, and Bashar Awwad Shiekh Hasan. Effective Training of Attention-based Contextual Biasing Adapters with Synthetic Audio for Personalised ASR. In *Interspeech*, 2023.
- [3] **Burin Naowarat**, Thananchai Kongthaworn, and Ekapol Chuangsuwanich. Word-level Confidence Estimation for CTC Models. In *Interspeech*, 2023.
- [4] Artit Suwanbandit, **Burin Naowarat**, and Ekapol Chuangsuwanich. Thai Dialect Corpus and Transfer-based Curriculum Learning Investigation for Dialect Automatic Speech Recognition. In *Interspeech*, 2023.
- [5] **Burin Naowarat**, Chawan Piansaddhayanon, and Ekapol Chuangsuwanich. Context Conditioning via Surrounding Predictions for Non-recurrent CTC Models. *IEEE ACCESS*, 2023.
- [6] Konpat Preechakul, Chawan Piansaddhayanon, **Burin Naowarat**, Tirsan Khandhawit, Sira Sriswasdi, and Ekapol Chuangsuwanich. Deep Set Latent Prediction. In *NeurIPS*, 2021.
- [7] Thananchai Kongthaworn, **Burin Naowarat**, and Ekapol Chuangsuwanich. Spectral and Latent Speech Representation Distortion for TTS Evaluation. In *Interspeech*, 2021.
- [8] **Burin Naowarat**, Thananchai Kongthaworn, Korrawe Karunratanakul, Sheng Hui Wu, and Ekapol Chuangsuwanich. Reducing Spelling Inconsistencies in Code-Switching ASR using Contextualized CTC Loss. In *ICASSP*, 2021.

WORK EXPERIENCE

Cerence – Remote, Thailand*Jun 23 - Jul 24**Language Modeling Engineer (Full-time contractor via emagine GmbH)*

- Reduced WER by over 50% (relative) on deployed Thai in-car ASR systems by enhancing lexical resources and n-gram language models for hybrid HMM-DNN systems.
- Improved entity recognition and intent classification accuracy by more than 10% absolute by aligning token segmentation between Thai ASR and NLP components.
- Prototyped a Conformer-based end-to-end Thai ASR system that outperformed the production hybrid HMM-DNN baseline on internal benchmarks and was subsequently released to production.
- Extended domain-specific textual data generation pipelines for language model training, ensuring comprehensive coverage of product entities.

Amazon – Cambridge, UK*Jun 22 - Nov 22**Applied Scientist Intern*

- Proposed and implemented a synthetic audio training method for attention-based contextual biasing adapters on neural transducers, achieving 16% WER reduction on named-entity recognition [2].
- Designed a projection module with consistency regularization to bridge the acoustic gap between TTS-synthesized and real speech, cutting real-speech annotation requirements by 50% without performance loss.

TrueVoice – Bangkok, Thailand*Jun 19 - Oct 21**Software Engineer under the contract of Chulalongkorn University*

- Developed and deployed production-scale HMM-DNN Thai ASR systems using Kaldi for the call-center domain, with domain adaptation across multiple low-resource topics.
- Investigated the correlation between model confidence scores and prediction quality, informing confidence calibration strategies for production deployment.

New Era AI Robotic – Remote, Thailand*Jul 19 - Feb 21**Research Assistant under the contract of Chulalongkorn University*

- Proposed CCTC loss for Thai-English code-switching ASR, halving spelling-inconsistent predictions over standard CTC while consistently improving WER across all decoder configurations [8].
- Trained Wav2Letter+-based non-autoregressive Thai-English ASR models, including designing the data collection and transcription pipeline for training corpora.

TECHNICAL SKILLS

Programming Languages

Python, Bash, C++

ML Frameworks

PyTorch, TensorFlow, Kaldi, ESPnet

Tools & Environments

Linux, Docker, Git, Slurm

LANGUAGES

Thai (native), English (professionally proficient)