Shunsuke Kikuchi

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EDUCATION

· **Shonan Senior High School,** Fujisawa, Kanagawa, Japan   Graduation: March 2021

    Known as one of the best public senior high schools in Japan.

· **Arkansas State University,** Jonesboro, AR   (Left for transfer, August 2023)

    Bachelor of Science in Exercise Science (GPA: 4.0)

· **University of California, Los Angeles** (Current)   Expected Graduation: Spring 2025

    Bachelor of Science in Computational and Systems Biology

ACTIVITY & ACHIEVEMENT

Kaggle competition: Expert, Highest Rank: **2,552/205,373**

- **Leash Bio - Predict New Medicines with BELKA** (**Silver medal, 27/1950**, 2024 Apr. – Jul.)

   This competition aims to accelerate drug discovery by enabling more precise predictions of drug outcomes based on biological data. Our team proposed 2 models – fine-tuned transfer learning model and 1DCNN model – achieved robustness on both the Public (8th) and Private (27th) leaderboards despite of the huge domain shift between them.

   HMS - Harmful Brain Activity Classification (**Bronze medal**, **245/2767**, 2024 Jan. – Apr.)

   This competition focuses on developing models to detect dangerous brain wave patterns using EEG data. Out team ensembled a 1D-ResNet and 2 spectrogram-based models with proper post-processing.

Conference Challenge:

   MICCAI – Endoscopic Vision Challenges 2024: (2024 Jun.- Sep.)

   Participated in 4 sub-challenges. **Oral presentation for solutions at MICCAI 2024 in person (Oct. 10).**

   · **Semantic Segmentation for Tools and Fold Edges in Colonoscopy data** (Segmentation: **1st-900€**, Active Learning: **2nd-400€**)
   4-class segmentation challenge focused on colonoscopy videos. Trained UNet-based models with auxiliary tasks to regulate embedding space with few variant training data, outperforming SOTA. Proposed clustering-based active learning algorithm.

   · **PhaKIR - Phase, Keypoint and Instrument Recognition** (Phase: **2nd-300€**, Instrument: **1st-450€**)

   This challenge aims to better recognition for surgical video. For the surgical phase task, we applied an EVA-02-based model with smoothing validation and rule-based post-processing. For the Instrument segmentation, we trained Mask2Former with pseudo-label by SAM2. Achieved Competitive Performance with appropriate classic approaches.

   · **Open Suturing Skills Challenge** (Task1 (GRS): **3rd**, Task2 (OSATS): **3rd**)

   This challenge aimed at classifying surgical suturing skills using videos from a simulated environment. The challenge involved predicting the total Global Rating Score (GRS) and the full OSATS scoring table for each video.

   · **Surgical Tissue Tracking Using the STIR (Surgical Tattoos in Infrared) Dataset** (2D: **3rd-$675**, 3D: **2nd-$450**)

   This Challenge focused on tracking points in surgical videos, involving optical flow prediction, key point estimation, stereo vision understanding, and feature extraction. For the 2D task, we applied the new algorithm MFT. For the 3D, we mapped 3D coordinates onto left and right cameras and tracked them independently by MFT.

   6th National Medical AI Contest in Japan (**4th prize**, 2024 Mar., **$100**)

   This challenge uses one of the largest CT organ segmentation datasets, Totalsegmentator, to detect abdominal organs in a 3D manner. We developed 3D-UNet++ by converting the 2D seresnext-Unet++ model into 3D by replacing convolution layers.

Research Poster Presentation

Create@State (Apr 18, 2023, Arkansas State University)

"Inhibition of Cephalic Pain By RgIA4, A Selective a9a10 Nicotinic Acetylcholine Receptor (nAChR) Antagonist"

BIG Summer Final Session (Aug. 16, 2024, UCLA)r

"scGRNdb - Cell Type Level Gene Regulatory Network Database for Single-cell Analysis Framework"

Volunteer

- Access and Accommodation Services, Arkansas State University, 2021 Fall – 2023 Spring

Note-Taker volunteers for students with disabilities.

ACADEMIC HONORS & SPECIAL AWARDS

Private funded Scholarship

Shonan Senior High School Alumni Foundation Scholarship for Overseas Study, 2021, **$5000**

URC-sciences summer, 2024 summer, **$4800**

Arkansas State University

ABI Undergraduate Research Scholarship, 2021 Fall - 2022 Spring

Chancellor's List, 2021 Fall, 2022 Spring, 2022 Fall, 2023 Spring

Honors College, 2022 Spring – 2023 Summer

University of California, Los Angeles

Honors Program, 2023 Fall – Present

WORK & RESEARCH EXPERIENCE

・**Research Assistant** (paid-position), 2021 Fall - 2023 Summer, Arkansas State University

Engaged in migraine studies at Dr. Xie's Lab at Arkansas State University, especially the project dealing with mice. Performed injections, behavioral testing, cardiac perfusion, blood collection, and tissue collection/slicing. Mice project leader in 2023 Summer.

・**Undergraduate Research Assistant**, 2023 Fall – Present, UCLA

Currently working in Dr. Xia Yang's Lab at UCLA. In two projects, one examines the relationship between air pollution and atherosclerosis from single-cell data, and the other designs an unsupervised learning model to predict gene networks from single-cell data.

・**Bruins-In-Genomics (B.I.G.) Summer Program Researcher**, 2024 Summer, UCLA

Participated as a student scholar in Dr. Yang's Lab. Developed an analysis pipeline for single-cell data using Gene Regulatory Networks. Constructed and validated the pipeline, including mathematically plausible graph clustering methods and filtering of cell-type GRNs by Disease Modeling.

・**Research Internship**, 2024 June – Present, Jmees Inc. (Tokyo, remote)

Research Internship as a machine-learning engineer at a company developing AI-assisted surgical systems for endoscopic surgery in Japan. During the summer, I participated in some MICCAI EndoScopic Challenges as part of my internship project. Having highly evaluated my skills, I'm currently in an independent research position at the company working with the National Cancer Center Japan to develop real-time high-accurate surgical video recognition AI to develop a surgical support system.