College of Computing and Data Science

NANYANG TECHNOLOGICAL UNIVERSITY SINGAPORE

PhD Position in Statistical Machine Learning

We are looking for motivated PhD candidates to join the newly established **Epistemic Intelligence & Computation (EPIC)** lab, led by upcoming Assistant Professor Siu Lun Chau, at the College of Computing and Data Science (CCDS), Nanyang Technological University (NTU), Singapore. Our mission is to advance the theory and practice of **Epistemic Machine Learning** —-developing AI systems that not only recognise the limitation of their knowledge, but also be able to communicate their insights and effectively collaborate with human users.

To achieve this, our research is structured around three major directions,

1. **Uncertainty-aware Machine Learning,**
2. **Explainable Machine Learning**, and
3. **Preference modelling**.

Within these themes, our research interests include, but are not limited to, **imprecise-probabilistic methods** (e.g. second-order uncertainty, credal sets, imprecise learning), **precise-probabilistic methods** (e.g. kernel methods, Gaussian processes, hypothesis testing), with applications on areas such as **human-AI collaboration**, **learning from choice and preference feedback**, **sequential experimental design** (e.g. active learning and Bayesian optimisation), **cooperative game theory**, and **causal inference**.

These areas form the foundation of our work, addressing complex and fundamental challenges in machine learning and AI.

What We Look For

Candidates for this position should possess a Master's degree in **Statistics, Mathematics, Machine Learning, Computer Science, Physics**, or a closely related discipline. Strong proficiency in mathematical reasoning and communication is highly desirable. Successful candidates will work on one of the three major research directions outlined above. Whether you have a specific interest in one (or more) of these areas or are open to exploring topics that align with your background and our group's expertise, the exact focus can be determined through discussion.

We are also committed to fostering a diverse, inclusive, and equitable research environment. We warmly welcome applications from individuals of all races, ethnicities, genders, sexual orientations, abilities, and backgrounds. We believe that diversity enhances innovation and collaboration, and we are dedicated to supporting all members of our community to achieve their full potential.

What We Offer

- **Fully-funded research student scholarships.** We offer fully-funded research student scholarships given out by NTU. There are also other prestigious scholarships we can apply together, including SINGA and AGS scholarship from A*STAR and the AISG fellowship from AI Singapore.
- **Challenging and intellectually stimulating research environment.** Our team is dedicated to addressing practical machine learning problems with the appropriate level of mathematical rigor. This approach ensures that our solutions are justified, robust, trustworthy, and reproducible, effectively bridging the gap between theoretical foundations and real-world applications.

- **Opportunities for international training and exposure.** Students in our group benefit from global collaborations and research visits to leading academic and research institutes, including Prof. Krikamol Muandet's Rational Intelligence Lab at CISPA Germany, Prof Dino Sejdionvic's Kernels and Information Processing Systems group at the Australian Institute of Machine Learning, Australia, Prof Xiaowen Dong's Network and Society lab at the University of Oxford, United Kingdom, Prof Edwin Fong's Lab at University of Hong Kong, Hong Kong, and Prof. Michele Caprio's Lab at the University of Manchester, United Kingdom.
- **A vibrant AI ecosystem in Singapore.** Singapore provides an ideal environment for advancing AI research, with its dynamic, international, and interdisciplinary community. Collaboration across universities is strongly encouraged, creating opportunities to engage with a variety of experts. Additionally, the ecosystem is enriched by partnerships with leading R&D institutes, such as the Agency for Science, Technology, and Research (A*STAR) and AI Singapore, and industrial labs like Bytedance and Meta, where applied AI challenges are addressed with direct societal and economic impact.

About CCDS

The College of Computing and Data Science (CCDS), formerly known as the School of Computer Science and Engineering, is NTU Singapore's newest academic college and a global leader in AI and computing. Established in 1988 as Singapore's first institution offering a degree in Computer Technology, CCDS has grown into a world-class institution renowned for its cutting-edge curriculum, impactful research, and distinguished faculty.

Today, CCDS is ranked 2nd in Artificial Intelligence (AI) and 2nd in Computer Science by U.S. News & World Report Best Global Universities, 2024. It is also ranked 8th in Data Science and AI and 9th in Computer Science and Information Systems by QS World University Rankings, 2024. As a hub of cutting-edge technology and groundbreaking research, CCDS equips students with the knowledge, critical thinking, and creativity needed to excel in the rapidly evolving fields of AI and computing. Our interdisciplinary research bridges computing with domains like healthcare, finance, humanities, and sustainability, addressing complex challenges with innovative solutions.

Located in the heart of Asia, CCDS aims to nurture the next generation of researchers, thinkers, and innovators in the digital age. We maintain an international and diverse work environment and seek applications from outstanding young researchers worldwide. **The working language is English.**

How to Apply

If our group's vision resonates with yours, please get in touch directly before submitting a formal application through the university. You can reach out to me at `a.siulun.chau[at]gmail.com` with the subject line: `New application for your group`. In your email, we would like to see that you have spent a minimum amount of time to find out whether our research aligns well with your interests and have a thought whether I might be a good fit as your supervisor.

Note that you are **not** required to have a clear and thought-out research plan before getting in touch (although it is encouraged). In the email, please also attach (if applicable) your

1. transcripts;
2. latest CV; and
3. some written work demonstrating your research experience (e.g. a thesis, preprint, published papers)

We look forward to receiving your application.