Data61 PhD opportunity: Knowledge-Sharing among AI, Privacy-Preserving Federated Transfer Learning

A PhD opportunity with a potential full scholarship is available for those interested in research involving privacy-enhancing technologies and federated learning.

Project description

Recent advancements in federated learning (FL) allows multiple parties to collaboratively train an artificial intelligence (AI) model without sharing raw data. However, FL is challenging in real-world applications because datasets may differ in both the sample and feature spaces. Transfer learning is an effective way to solve the difficulty of data annotation by transferring knowledge from a related source domain to the target domain. For example, a bank might train an AI model of clients' debt repayment behaviour using the knowledge in another AI model trained by a fashion retail company. However, data privacy becomes a serious concern when cross-organizational transfer learning is conducted. Thus, in this project, we aim to address the challenges in dealing with heterogeneous data from multiple sources to perform model training safely and efficiently without violating data privacy and confidentiality. The PhD student will focus on the following tasks:

1. Conduct a comprehensive study on the existing federated and transfer learning techniques,

2. Develop algorithms/techniques with strong privacy guarantees to deal with heterogeneous feature spaces using transfer learning considering efficiency and scalability,

3. Conduct extensive experiments on real-world applications.

The expected outputs include publications in high-impact conferences/journals on data privacy and machine learning. The project outcomes may also benefit a wide range of science fields, as well as many sectors, including cybersecurity and health analytics.

Skills/Capability required for the project

- Bachelor's degree in Computer Science or relevant field.
- Programming experience in Python.
- Knowledge in artificial intelligence and machine learning is preferable.

For more details and how to apply, please visit the following link
https://jobs.csiro.au/job/Various-Data61-PhD-Scholarships/796808000/?locale=en_GB