Title: From Software Freedom to Academic Freedom

Abstract:

Software has become fundamental infrastructure for academic life. It shapes how we develop systems, conduct experiments, analyse data, teach students, collaborate, and communicate research. Yet much of this work increasingly depends on closed platforms that academics cannot fully inspect, modify, verify, or control. Drawing on my experience of using Linux and open-source software in research, teaching, embedded-system development, high-performance computing, and everyday academic work, this seminar explores why software freedom should be regarded as an important foundation of academic freedom.

The talk will illustrate how Linux enables researchers and students to work directly with operating systems, device drivers, networks, sensors, scientific software, and physical hardware rather than treating computing platforms as inaccessible black boxes. It will also consider why software freedom is becoming even more important in the age of artificial intelligence, when models, training data, research workflows, and essential academic services may be opaque, externally controlled, or available only through subscription platforms.

The seminar concludes with practical proposals: adopting Linux for everyday academic work where feasible, prioritising reproducible research with accessible software and models, using open-source systems in teaching, and establishing a dedicated Linux laboratory where students can manage real computers and gain authentic, hands-on systems experience.

Short bio:

Zhiyi Huang is a computer scientist in the School of Computing at the University of Otago and a strong advocate for software freedom. He has taught Linux kernel programming for 15 years and network management for more than 20 years. His work spans operating systems, computer networks, high-performance computing, embedded systems, and artificial intelligence for health applications. He has programmed platforms ranging from supercomputers and multicore servers to Raspberry Pi, Arduino, ARM, and RISC-V systems, using languages from assembly and C to Java and Python. His recent projects integrate hardware and software to create working prototypes, including mind-controlled drones and a PPG-based blood-glucose sensing system. He regards open-source software as a foundation for innovation, practical problem-solving, and the academic “can-do” and DIY spirit. His research interests include AI/ML applications in health science, signal processing, high performance computing, operating systems, computer networks, and computer architecture.