Ensuring Trust in Intelligent Systems: The Role of Formal Methods

As intelligent systems become increasingly ubiquitous—powering everything from autonomous vehicles to automated decision-making—their reliability and safety are paramount. In mission-critical applications, even rare errors can have catastrophic consequences. How can we ensure that such systems behave as intended under all possible scenarios?

Formal methods offer a principled and mathematically rigorous approach to modelling, specifying, and verifying system behaviour. In this talk, we explore how formal verification can contribute to the development of trustworthy intelligent systems. We will examine various verification techniques, and discuss emerging challenges and opportunities in this nascent but vital area. As smart systems become more complex and embedded in our daily lives, formal methods will play an increasingly crucial role in ensuring their correctness, safety, and accountability.