

Abstract

This thesis explores the transformative impact of autonomous vehicles on the transportation industry and emphasizes the critical need for robust control systems. It advocates for advanced formal verification techniques, such as model checking, theorem proving, and symbolic execution, to ensure the safety and dependability of autonomous vehicle control systems. The research contributes new tools and methods for formal verification, addressing the challenges of real-world scenarios, and aims to bridge the gap between theory and practice. Ultimately, this work represents a significant step toward achieving the safety and reliability necessary for a future where self-driving cars can operate on our roads with confidence and security.