

The Verified Software Programme

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In 2011, Mark Andreessen, the creator of the first web browser, said “Software is eating the world.” Indeed, software is critical for banking, medical devices, cars, planes, factories, the power grid, and a whole lot more. Bugs in software can be annoying; they can also cause these systems to fail in catastrophic ways resulting in damage ranging from identity theft, loss of property privacy, to loss of life. Science and engineering have also come to rely on software as a basic tool for calculation, modeling, simulation, archiving, and reporting.

The Verified Software programme lays the foundation for a rigorous science for specifying what computer hardware and software should or should not do, for building software that respects this specification, and for creating an ecosystem where we have the tools needed to compose complex software systems. The 2022 Verified Software programme kicked things off with a week-long workshop that included presentations from industry-based researchers at Microsoft, Bedrock, Amazon, Synopsys, and Certora, as well as a number of academic researchers. The talks covered software-defined networking, hypervisors, hardware processors, cryptographic libraries, cloud platforms, program logics, and verification tools. The rest of the six-week programme featured a number of mini-events focused on Web Assembly, Rust and C verification, model checking, cyber-physical systems, concurrency, program synthesis, cryptographic systems, and formal method education.

The program led to a number of interactions and cooperative initiatives for creating an ecosystem for achieving measurable and impactful advances in the scientific and engineering foundations of verified software.