

Max Planck Institute for Software Systems (MPI-SWS)



The Max Planck Institute for Software Systems is chartered to conduct high-risk, high-impact fundamental research in all areas related to the design, analysis, modeling, implementation and evaluation of complex software systems. Software Systems is that part of Computer Science that lays the foundation for the practical use of computers. In the decades since the first rudimentary computer programs were implemented, Software Systems research has pursued fundamental questions about building computers and computer systems.

The MPI-SWS was founded in November 2004 and opened its doors in August 2005. The institute has two sites, one located on the campus of Saarland University (UdS), the other on the campus of the Technical University (TU) Kaiserslautern. As an academic institution dedicated to high-risk, long-term research, the primary goal is to have impact through publications, artifacts and people. The MPI-SWS seeks to establish itself among the top twenty academic research organizations in the world in its field. In particular, we hope to attract outstanding talent from all over the world, thus broadening the pool of talent in Germany and Europe. MPI-SWS currently has 3 directors, 5 tenured or tenure-track faculty members and one Max Planck Fellow. MPI-SWS will eventually grow to 17 tenured positions. The profile of MPI-SWS is highly international, with faculty members from the USA, Germany, India, Turkey and Portugal.

Currently, the faculty at MPI-SWS conduct research in the following areas: Dependable Systems, Distributed Systems and Operating Systems, Information Security and Cryptography, Large Scale Internet Systems, Networked Systems, Programming Languages and Systems, Rigorous Software Engineering, Type Systems and Functional Programming. The set of research topics within software systems will expand as MPI-SWS hires new faculty.

Research Areas

Dependable Systems: This group, headed by Rodrigo Rodrigues, focuses on building reliable, highly-available software systems, by improving the methods used to build such systems.

Distributed Systems and Operating Systems: This group, headed by Peter Druschel, conducts research in the design, implementation and evaluation of computer systems.

Information Security and Cryptography: This group, headed by Michael Backes, conducts research in theoretical foundations and applied aspects of information security and cryptography.

Large Scale Internet Systems: This group, headed by Paul Francis, attacks problems associated with Internet routing and addressing, overlay networks, Internet security, and cloud computing.

Networked Systems: This group, headed by Krishna Gummadi, conducts research in both experimental and theoretical aspects of networked systems design.

Programming Languages and Systems: This group, headed by Umut Acar, researches the foundations, design and implementation of programming languages and systems.

Rigorous Software Engineering: This group, headed by Rupak Majumdar, focuses on algorithms, tools, and methodologies to build complex yet reliable software systems.

Type Systems and Functional Programming: This group, headed by Derek Dreyer, conducts research in both the theoretical and practical aspects of modern programming language design, with a primary focus on type systems and functional programming.



Max Planck Institute for Software Systems, location Kaiserslautern

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