The RISC Software Company, founded by the RISC institute and now owned by the Johannes Kepler University, employs more than 25 software developers. It offers customers innovative software solutions in the following areas:

- Analysis and Simulation,
- Modeling and Optimization,
- Planning and Control,
- Telematics.

The RISC Software Company builds upon the expertise of the RISC institute and works in close cooperation with its members.

**Initiatives**

RISC has been the center of numerous scientific, educational, and industrial initiatives, such as:

- The Journal of Symbolic Computation, the major scientific journal in the area of symbolic computation established by Prof. Buchberger in 1985 and published by Elsevier,
- The Softwarepark Hagenberg, an industrial park directed by Prof. Buchberger with about 35 companies and 800 employees working on software and information technology,
- The University of Applied Sciences at Hagenberg, with 9 degree programmes related to information technology and multimedia with about 1200 students, and
- The Software Competence Center Hagenberg where academic institutions and industrial enterprises cooperate in joint research and development.

Since RISC has moved to Hagenberg in 1989, the village has by these initiatives become a major economic factor in the region.

**Faculty**

- **Keroly Bosa** (assistant professor)
  - Parallel, Distributed, Grid Computing

- **Bruno Buchberger** (full professor, founder of RISC)
  - Computer Algebra, Automated Reasoning

- **Keroly Irdeli** (chairman of system administration)
  - Computer and Network Infrastructure

- **Ralf Hemmecke** (assistant professor)
  - Computer Algebra

- **Tudor Jebelean** (associate professor)
  - Automated Reasoning, Parallel Computing

- **Elena Kartashova** (associate professor)
  - Linear PDEs, Nonlinear PDEs, Resonances

- **Manuel Kauers** (full professor)
  - Algorithmic Combinatorics, Computer Algebra

- **Teimuraz Kutsia** (assistant professor)
  - Automated Reasoning, Logic Programming

- **Günter Landsmann** (assistant professor)
  - Computer Algebra, Algebraic Geometry

- **Franz Lichtenberger** (staff scientist)
  - Formal Methods, Mathematics Education

- **Peter Paule** (full professor, chairman of RISC)
  - Computer Algebra, Combinatorics

- **Veronika Pillwein** (assistant professor)
  - Special Functions, High Order Finite Elements

- **Nikolaj Popov** (assistant professor)
  - Program Verification

- **Heinrich Rolletschek** (associate professor)
  - Algorithm Theory, Computability Theory

- **Josef Schicho** (associate professor, currently on leave)
  - Algebraic Geometry, Computer Algebra

- **Carsten Schneider** (associate professor)
  - Combinatorics, Computer Algebra

- **Wolfgang Schreiner** (associate professor)
  - Formal Methods, Parallel and Distributed Computing

- **Wolfgang Windsteiger** (associate professor)
  - Automated Reasoning, Computer Algebra

- **Franz Winkler** (full professor, vice-chairman of RISC)
  - Computer Algebra, Geometric Computation

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RISC
Research Institute for Symbolic Computation
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Symbolic Computation

Symbolic computation is the subarea of mathematics and computer science
which solves problems on symbolic objects representable on a computer
(such as algebraic expressions, logical propositions, and computer
programs),
whose solutions are integrated in many advanced software systems
for computer algebra, computer aided design and manufacturing,
computer supported reasoning, knowledge management, and system
specification and verification.

Besides playing a fundamental role within mathematics itself,
symbolic computation is a key technology in many scientific and
technical areas.

RISC

RISC (Research Institute for Symbolic Computation) is an
institute of the Johannes Kepler University in Linz, Austria.

The institute was founded by Prof. Bruno Buchberger in 1987 and is
currently chaired by Prof. Peter Paule. The faculty of RISC consists
of 19 members supervising about 25 international Ph.D. students and
several diploma students in mathematics and computer science.
The working language of the institute is English. RISC is located in the
beautifully renovated medieval castle of Hagenberg, approximately
20 km northeast of Linz.

RISC pursues research, education, and the industrial
application of symbolic computation.

More than any other area, symbolic computation depends on the integration
of the theoretical foundations (mathematics, logics, algorithms), the
implementation in software systems, and the practical applications.
RISC offers a comprehensive symbolic computation curriculum whose main
goal is to unite these aspects. RISC considers research, education, and the
industrial application of symbolic computation as the three facets of a
“spiral of creativity” which drive each other higher and higher.

Research

RISC is committed to excellence in research.

Within the realm of symbolic computation, research at RISC mainly
falls into three general categories:

- **Computer Algebra**: We design and implement algorithms that operate
  on algebraic expressions; typical application areas are (algebraic) geometry
  and (algorithmic) combinatorics.
- **Computational Logic**: We work on the specification, management,
  and derivation of knowledge expressed in the language of symbolic
  logic (resulting in software systems for supporting mathematical
  proving) and on the theory of computation.
- **Mathematical Software**: We develop various symbolic computation
  software such as it occurs in computer algebra systems and theorem
  provers and study the logical foundations of software for the purpose
  of formal system specification and verification.

These categories present different views on the same subject with
strong overlappings and interrelationships.

Projects and Cooperation

RISC pursues strong cooperation with the national
and international scientific community.

- **Research Projects and Cooperation**: RISC has carried out numerous research projects with various partners
  supported by national and international funding agencies.
- **Special Research Program**: RISC is a key participant in the Special Research Program „Numerical
  and Symbolic Scientific Computing” of the Austrian Science Foundation
  (FWF) at the JKU (chairman: Prof. Peter Paule, RISC).
- **Computational Logic**: RISC has helped building up the Johann Radon Institute for Computational
  and Applied Mathematics (RICAM) of the Austrian Academy of Sciences.
- **Symbolic Computation**: RISC has been a founding member of the Austrian Center for Parallel
  Computation (ACPC) and of the Austrian Grid (AGRID).
- **Industry**: RISC has organized numerous international conferences and workshops; members of RISC are regularly invited as key note speakers and members
  of program committees.

A report of the US science foundation NSF about RISC concluded already
in 1989 „There is no comparable facility in the United States.“

Education

RISC offers a comprehensive curriculum in symbolic
computation for students in mathematics or computer science.

About 25 Ph.D. students (most of them from foreign countries) and a
number of M.Sc. students are pursuing their studies at RISC in an inspiring
research-oriented working environment. They are integrated into
various projects and work in close contact with internationally recognized
researchers and with fellow students on their Ph.D. topics at the
scientific forefront.

The Ph.D. program takes 3-4 years and is organized as follows:

- **Courses**: During the second and third semester, the student attends
  courses from the RISC curriculum introducing him/her to the scientific
  topics pursued at RISC.
- **Projects**: After two semesters, the student agrees with a member of
  the RISC faculty on the supervision of a Ph.D. thesis, typically within the
  frame of a research project.
- **Thesis**: In the subsequent two years, the student works on the
  thesis under the guidance of the advisor. The thesis is finally presented
  and defended according to the rules of the Johannes Kepler University.

An international committee evaluating all Austrian mathematics
institutes in 2005 proposed the RISC Ph.D. program as a model.