PROFESSORSHIP FOR
FORMAL METHODS

INFORMATION FOR APPLICANTS
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1. The Johannes Kepler University Linz (Austria)

Firmly anchored in the region, the Johannes Kepler University Linz (JKU) also considers itself a university with a strong international outlook, pursuing an unwavering commitment to quality in research and education. The JKU aims to consistently move forward and advance to become one of Europe’s top universities.

JKU researchers (approximately 160 professors and 2,600 academic employees) continuously pursue new knowledge and insight, deepening our insight in terms of what we know and understand today. The university also places great value on knowledge transfer, further deepening dialogue with members of society, the business community, and cultural establishments. As Upper Austria’s largest educational institution, the JKU not only focuses on both education and research, but also on the regional and global challenges of our time, particularly those as outlined in the JKU’s third mission (science with and for society).

Today, as an effectively positioned university, the JKU hones core skills and expertise in technology (engineering, computer sciences, natural sciences), social sciences, economics & business, education, law, and medicine. The JKU is predestined to engage in the academic and scientific challenges of our time, particularly in regard to digitalization and sustainability as well as values in support of diversity and inclusion. We not only foster a visionary approach, the JKU emphasizes and practices interdisciplinary and transdisciplinary research and academics.

The JKU is strongly committed to supporting social responsibility that extends beyond research and education. For example, meat served at the university’s award-winning cafeteria stems from organic farms. The university established the LIT Open Innovation Center on campus, a facility at the crossroads of academia, science, research, and real-world practices designed to support and bring about a circular economy and sustainable polymers. Recent campus enhancements complement the quality of university facilities, providing a contemporary infrastructure that not only inspires creativity, but also serves as a dynamic work, recreational, and living space for university employees, students and local residents alike.

We also offer a comprehensive onboarding process for new employees. Whether you are coming to the JKU from elsewhere in Austria or from abroad, our staff at the Office of Dual Career Services and at the JKU Welcome Center can assist to find housing, provide information about local schools and, of course, help your spouse or partner find suitable employment so everyone feels more quickly at home in Linz. The JKU aims to pursue its objectives and embrace the coming challenges by attracting students and faculty who also aspire to play a key role in contributing toward a future that not only supports technological advancement and progress, but a future that also serves the people and conserves the environment.
2. The Faculty of Engineering & Natural Sciences

Students enrolled at the JKU can choose from over 30 academic degree programs in engineering and naturals sciences offered at 60 institutes. The JKU has a strong tradition of conducting advanced, cutting-edge research at the forefront of technology and engineering. Always a step ahead, the JKU introduced the world's first academic degree program in Mechatronics in 1990 and in 2019, the university launched two unique academic degree programs, one in Artificial Intelligence and another in Medical Engineering which brings medical and engineering expertise together. A high number of publications, research contracts, Austrian Science Fund projects, EU projects, special research areas, and dissertations are a testament to the Faculty’s scientific and scholarly achievements. By creating competence centers, housing Christian Doppler laboratories, and supporting spin-off companies, technology-oriented companies appreciate the JKU Faculty of Engineering and Natural Sciences as an internationally valued partner.

3. The Department of Computer Science

The department of Computer Science (http://informatik.jku.at) at the Faculty of Engineering & Natural Sciences consists of the following institutes:

- Institute for Application-Oriented Knowledge Processing
- Institute of Computational Perception
- Institute for Complex Systems
- Institute of Computer Graphics
- Institute for Formal Models and Verification
- Institute for Integrated Circuits
- Institute for Machine Learning
- Institute of Networks and Security
- Institute of Pervasive Computing
- Institute of Signal Processing
- Institute of Software Systems Engineering
- Institute for Symbolic Artificial Intelligence
- Institute for System Software
- Institute of Telecooperation

The JKU was the first university in Austria to introduce studies in Computer Science back in 1969. Today, over 1,000 students are enrolled in Computer Science. The Bachelor’s and Master’s degree programs in Computer Science are internationally renowned; this is reflected in relevant program rankings. Recently, new Artificial Intelligence Bachelor’s and Master’s degree programs were introduced. Many computer scientists from Linz are research leaders in their fields (including ERC and
Wittgenstein awardees). Computer Science at the JKU is distinguished by outstanding fundamental research and close collaboration with industry.

4. General Requirements for the Professorship in Formal Methods

The main task of this professorship is to represent the field of “Formal Methods” in research and education. The position is being filled at the Institute for Formal Models and Verification. The successful candidate will succeed Prof. Armin Biere as head of this institute.

4.1. Research

This professorship will focus on the development and application of formal methods for the correctness of software and hardware systems. The applicants should comprehensively represent this field in computer science and should be internationally renowned experts in at least one research area of formal methods. These include but are not limited to:

- Formal verification or synthesis of software and hardware
- Techniques and tools of formal verification (e.g., model checking, equivalence checking, deductive verification, symbolic execution)
- Formal models and languages (e.g., logic-based languages, graph transformation systems, Petri nets, process algebra)
- Automatic reasoning and decision procedures (e.g., SAT, SMT, first-order logic, interactive theorem proving)
- Theoretical foundations of formal verification or synthesis (e.g., computational logic, complexity theory, discrete structures, game theory)
- Applications of verification and synthesis like concurrent/distributed systems, cyber-physical systems, analysis of programs and protocols, biological applications, and future technologies like quantum computing and artificial intelligence
- Model-based testing and runtime verification
- Formal analysis and verification of artificial intelligence technologies
- Probabilistic and statistical approaches for formal reasoning

The applicant’s excellence will be given a higher priority than the research area he/she is representing.

Special emphasis will be put on the combination of theoretical foundations and the algorithmic and practical realization of the investigated techniques. Furthermore, the applicants should highlight potential collaborations with different institutes of the Computer Science Department, with the Linz Institute of Technology (LIT), and the Faculty of Engineering & Natural Sciences.
The candidate’s application regarding his/her qualifications in research will be considered under the following criteria:

- Research skills and abilities in a recent research area in the field of Formal Methods
- Doctoral degree and post-doctoral degree/habilitation (venia docendi), or a comparable post-doctoral qualification, preferably in one of the research fields mentioned above
- Scientific activities at universities, research institutions, or industrial companies in Austria or abroad
- Academic/scientific reputation demonstrated through high-quality publications in internationally renowned peer-reviewed journals and at conferences on subjects with a high degree of relevance in the position’s research area (list of publications, attachment of the 5-8 publications most relevant for the position)
- Scientific presentations (list of invited talks and lectures)
- Joint research on national and international level; potential to collaborate with available facilities at the location of Linz
- Editorial and reviewing activities, conference organization, etc.
- International experience demonstrated by longer stays abroad, successful cooperation with international universities and research institutions, and the involvement in the international scientific community
- Acquisition of research funding; management of or participation in research projects (function, project volume, funding organization or contracting party, duration, principal investigator and/or number of full-time employees when leading a project)
- Research concept for future activities as a professor for Formal Methods (in the context of previous research)

When assessing the candidates' accomplishments, performance, and future potential, the JKU will take the candidates' individual background and personal history into account by acknowledging that academic and professional success and accomplishments can happen at different stages in life (and can include periods of reduced employment, or career interruption on account of having to provide care, childcare, etc.). In this regard, qualifications are assessed and evaluated in terms of equal opportunity, taking life-course factors, such as academic age, into account.

4.2. Teaching

The JKU is committed to research-guided teaching. The successful applicant is expected to offer basic university-level courses in Computer Science and Artificial Intelligence as well as courses in his/her area
of specialization. The applicant is expected to actively take part in the educational programs of Computer Science and Artificial Intelligence as well as to teach service courses of the department. As many programs at the JKU are international, the successful candidate should be proficient in English and able to hold university-level courses and presentations in English.

The candidate’s application regarding his/her qualifications in teaching will be considered under the following criteria:

- Didactic skills
- Experience in holding university-level courses (list of previously held courses, course evaluation results and, if available, any participation in university-level didactic continuing education courses and/or programs)
- Experience in supervising academic work of students such as PhD theses and Master’s/Diploma degree theses (list of supervised theses)
- Teaching concept for future activities as a professor for Formal Methods at the JKU

### 4.3. Additional Requirements

The successful candidate must be willing to collaborate with research institutions and facilities in Austria or abroad as well as with industrial companies. The cooperation efforts should result in attracting external funding.

The successful candidate will have the ability to manage and further develop the Institute for Formal Models and Verification. He/she is willing to actively take part in academic administration and in university committees.

In addition to key professional qualifications and management experience, the successful candidate should also have a strong social skill set.

Furthermore, it is expected that within a reasonable time-frame, the successful candidate becomes proficient in the German language to actively participate in the administrative processes of JKU.

The candidate’s application regarding his/her qualifications for the position will be considered under the following criteria:

- Previous research collaborations with partners at other universities in Austria and/or abroad
- Proof of qualifications of the ability to manage an organizational unit, research projects, etc.
• Proof of qualification and ability of cooperative leadership, in human resource development, and in scientific public outreach; in accordance with the JKU’s “Plan for the Advancement of Women”, experience in human resource development and advancement opportunities for women and participation in gender mainstreaming and diversity projects are also relevant selection criteria. Corresponding documentation, if available, should be included.

4.4. Activities – Significance and Time Span

Overall, the fields of research and teaching are equally important.

A balance between research, teaching and independent administrative tasks is desired; approximately 40% teaching, 40% research, and 20% administration. The successful candidate is also expected to actively and independently participate in administrative committees at the university.

5. Legal Contingencies

Effective as of January 1, 2004, the structure of Austrian universities has been completely re-organized. They are independently financed on the basis of a three-year service level agreement with the Austrian government, have a global budget at their disposal, and are not subject to any directives by the Austrian Federal Ministry of Science and Research.

5.1. Terms of Employment

All terms of employment, including a university professorship, are subject to the Private Sector Employees Act. A work contract between the university and the appointed professor confirms the professor’s appointment. The Salaried Employees Act and the collective agreement for university employees provide the legal framework for all related labor, social, and pension conditions. An evaluation of all teaching and research activities will be conducted after a 5-year period to assess the fulfillment of all target agreements.

5.2. Pension Regulations

5.2.1. Pension

A pension account at the Pension Insurance Company for Employees (PVA) provides the basis to calculate the amount of pension. All pension account holders are registered for annual partial credits during insurance periods in the amount of 1.78% of the annual contribution basis and these are capped at the maximum assessment basis. The sum of the partial credits is the total credits that are re-valued annually. The total credit divided by 14 equals the amount of gross monthly pension. For more information about the pension you receive directly from the state, please contact the PVA.
5.2.2. Company Pension Fund for University Professors

In compliance with the Universities Act 2002, a special pension scheme is provided for university professors and has been agreed upon in a Collective Agreement. The contribution payment made by the university is 10% for the set minimum salary as stated in the collective agreement. Voluntary salary payments agreed upon aside from the collective agreement minimum salary are not a part of the base calculation of the contribution payments.

6. Salary

The amount of the minimum salary for Group A 1 (Professorship) has been determined in the collective agreement for university employees and is a gross annual salary of 81,571.00 Euros per year (last update: 2023). Payment is allocated in 14 equal amounts, whereby two parts are special allocated payments.

The position as Professor for “Formal Methods” provides a provision (on a voluntary basis) to agree on a salary over the minimum salary set by the collective agreement.

After a positive evaluation every six years – 4 times in total – there will be an advance to the next pay grade in accordance to the salary bracket in collective agreement for job category A 1.

7. Application Procedure

Prospective applicants for the professorship position “Formal Methods” are requested to send the following application and requested documentation in electronic form to: application@jku.at. If documents cannot be sent in electronic format, they are to be sent in quintuplet copy and should arrive at the Rector’s office no later than one week after the end of the application deadline.

7.1. General Information

- Applicant form
- Letter of Intent (1 page)
- Tabular Curriculum Vitae
- Academic diplomas (Doctorate, Post-Doctorate [Habilitation])

7.2. Research

- Successful completion of a post-doctoral degree (venia docendi) or a comparable, international recognized post-doctoral qualification
- Publication list, attachment of the 5-8 of the most relevant publications
- List of scientific presentations/lectures as an invited speaker
• International experience demonstrated through longer stays abroad, cooperation efforts with international universities and research facilities, and the involvement in the international research community
• List of acquired research funding; management of or participation in research projects (function, project volume, contracting party and/or funding organization, duration, principal investigator and/or number of full-time employees when managing the project)
• Research concept for future activities as the professor for Formal Methods at the JKU (including your own previous activities and work)

7.3. Teaching

• List of previously held courses, course evaluation results and, if available, any participation in university-level didactic continual education courses and/or programs
• List of supervised PhD theses and Master’s/Diploma degree theses
• Teaching concept for future activities as a professor for Formal Methods at the JKU

7.4. Miscellaneous

• List of previous research collaborations with partners at other universities in Austria and/or abroad
• Proof of qualifications of the ability to manage an organizational unit, research projects, etc.
• Proof of qualification and ability of cooperative leadership, in human resource development, and in scientific public outreach; in accordance with the JKU’s “Plan for the Advancement of Women”, experience in human resource development and advancement opportunities for women and participation in gender mainstreaming and diversity projects are also relevant selection criteria. Corresponding documentation, if available, should be included.

8. Information

If you have any questions about the position, please contact Univ. Prof. Dr. Martina Seidl (+43 (732) 2468 5750, martina.seidl@jku.at).