

Ondrej Rohlik

Sportovni 21, CZ-30100 Pilsen, Czech Republic
+420 377 63 24 50 (office), +420 736 10 52 59 (mobile)

ondrej@rohlik.org

<http://rohlik.org/>

Nationality & Citizenship: Czech

Date of Birth: 3 October 1975

Languages: Czech & English (fluent), Slovak (fair), German & Russian (basic)



Dr. Rohlik is a software engineer with a strong background in on-board software reuse and modeling for satellite applications. He gathered his experience while involved in several projects coordinated and/or funded by European Space Agency (ESA) between 2003 and 2009. Till 2009 he worked as consultant for a privately held Swiss company operating in space sector. Since 2008 he holds a faculty position at the University of West Bohemia in Pilsen. Currently he acts as an advisor at the Czech Ministry of Transport and serves as a delegate to boards and committees of ESA.

EDUCATION

- **Ph.D.** in Computer Science, 2000 – 2004, University of West Bohemia in Pilsen
- **Ing. (MSc.)** in Computer Science *with distinction*, 1994 – 1999, University of West Bohemia in Pilsen
- Certified Lecturer for Institutions of Higher Education, 1996 – 1998, University of West Bohemia
- Masaryk's High School in Pilsen *with distinction*, 1990 – 1994, specialization in natural sciences

EXPERIENCE

Ministry of Transport of the Czech Republic – Section of Satellite Systems

Advisor (from 2009, part-time) – <http://www.mdcz.cz/>

- Delegate to ESA Industrial Policy Committee (IPC), Launchers Programme Board (PB-LAU), and Programme Board for Human Spaceflights, Microgravity, and Exploration (PB-HME & SBD)
- Advisor on space applications, R&D, and technology harmonization (THAG)

University of West Bohemia in Pilsen – Department of Computer Science and Engineering

Researcher and lecturer (from 2008 full-time, from 2009 part-time) – <http://www.kiv.zcu.cz/>

- Research areas: software engineering for embedded and on-board software, domain engineering; generative programming, aspect-oriented programming for critical systems

P&P Software GmbH, Taegerwilten, Switzerland

Consultant (from 2007, part-time) – <http://www.pnp-software.com/>

- Research areas: generic software architectures for space missions; model-drive engineering, code generation, and formal model validation techniques
- Development of open-source, public-domain building blocks for the packet-utilization service
- Consulting for an ESA project as a subcontractor of Thales Alenia Space (Cannes branch)

ETH Zurich / Swiss Federal Institute of Technology in Zurich – Automatic Control Laboratory

Post-doctoral fellow (2003 – 2007, full-time) – <http://control.ee.ethz.ch/>

- Research areas: generative programming, aspect-oriented programming, requirements engineering, domain specific languages; design patterns, SW frameworks, SW certification
- Co-organized IFAC Congress 2005 (special session on SW adaptability techniques)

University of West Bohemia in Pilsen – Department of Computer Science and Engineering

Researcher and lecturer (1999 – 2003, full-time), Ph.D. candidate (2000 – 2003, part-time)

- Research areas: biometrics, classification and pattern recognition, neural networks, speech recognition and computer linguistics, data mining and knowledge discovery, e-learning
- Co-organized International Conference on Text, Speech & Dialogue (in 1999, 2001, and 2003)

PROJECTS

- **CORDET Component Oriented Development Techniques** (2007 – 2009) *definition of generic architecture for on-board software*, <http://www.pnp-software.com/cordet/> (ESA contract 20463/06/NL/JD)
 - defined a detailed methodology for development of software frameworks for on-board applications aiming at application-level part of a generic architecture
 - implementing subset of ISO/IEC 12207 process using model-drive approach, separation of functional and non-functional design, Ada2005 model-to-code generation, and traceability from requirements phase to design phase
- **ASSERT – Automated Proof-Based System and Software Engineering for Real-Time Applications** (2004 – 2007) *Work package 4.2: Design and Methods for Prototyping Software Building Blocks*, <http://www.assert-online.net/> (EU contract IST-004033)
 - defined an approach to separation of functional and non-functional (timing) design of *reusable* and *verifiable* software components for on-board systems
 - formalized the design rules in a form of two UML profiles and implemented corresponding profile validators as plug-ins for Eclipse UML2 toolset and IBM Rational Software Modeler
 - designed two model-to-code generators for Java and Ada using Eclipse JET and MOFScript
 - reviewed a satellite control domain analysis and defined a family model of satellite systems
 - implemented AADL *code generator* and applied it on Battery Management Subsystem (BMS) *feature model* of satellite control systems for Thales Alenia Space company (a project partner)
- **XWeaver: Aspect Oriented Programming for On-Board Applications** (2003 – 2005) – *an aspect weaver and code transformation tool for C/C++ and Java implemented in XSLT*, <http://www.xweaver.org/> (ESA contract 18664/04/NL/LvH)
 - developed an aspect weaver targeted to applications with high reliability requirements
 - co-designed the aspect weaver and the corresponding aspect language
 - implemented and maintained various parts of the weaver (XSLT programming)
 - built library of over 30 sample aspects that serve as demonstration of XWeaver capabilities
 - supervised a master thesis project – XWeaver GUI development (an Eclipse plug-in)
 - ETH project manager (90k EUR budget)
- **XSLTdoc** (2004 – 2005) – *a Javadoc-like tool for all versions of XSLT (1.0, 1.1, 2.0)*, <http://www.pnp-software.com/XSLTdoc/> (within ESA contract 18664/04/NL/LvH)
 - designed initial version of the tool; maintain its current version (XSLT programming)
- **XFeature: Product Family Modeling Tool** (2004 – 2005) – *highly configurable requirements engineering tool (Eclipse plug-in) that supports specification of an application within an application family using graphical domain specific language*, <http://www.pnp-software.com/XFeature/> (ESA contract 18499/04/NL/LvH)
 - designed the overall architecture of the tool
 - implemented the Eclipse plug-in using Eclipse GEF (Java programming)
 - developed four default tool configurations – each configuration includes: family meta-model and family display model (XML Schema programming), plus two XSL-based model generators
 - ETH project manager (50k EUR budget)
- **Feature-Based Framework Modeling** (2004) – *XML-based modeling approach to automated software framework instantiation process*, <http://control.ee.ethz.ch/~ceg/fbfm/> (internal funding of ETH Zurich)
 - designed the overall feature modeling approach to framework instantiation
 - implemented the feature meta-model and the feature model editor using XML Schema (XSD) and Eclipse Modeling Framework (EMF)
 - designed and prototyped non-local constraints extension to feature modeling
 - supervised a master project – an Eclipse feature modeling plug-in based on EMF and GEF

- **Biometrical Smart Pen (1999 – 2003)** – *Ph.D. project on handwritten text recognition and signature verification, <http://www.bisp-regensburg.de/> (thesis available at <http://control.ee.ethz.ch/~rohliko/diss/>)*
 - contributed to the design of a biometrical data acquisition pen and implemented biometric signal acquisition software; collected the state-of-the-art database of over 2000 signatures
 - defined a measure of handwritten signature similarity based on the imitation of techniques used by forensic experts; implemented a prototype verifier (C, Matlab & Delphi programming)
 - employed user-dependent characteristics to further improve the performance of the verifier
 - modeled the intersession variability of signatures and adapted the verifier accordingly
 - experimented with SOM and ART-2 neural networks for signature verification
 - advised seven master theses and about 20 student projects
- **Short Document Categorization (1999 – 2000)** – *text-mining project; research into automatic document classification in a digital library, <http://www.kiv.zcu.cz/research/groups/text/>*
 - developed and implemented a method for classification of short documents (abstracts and summaries) using itemsets (ANSI C programming)
 - profiled and optimized memory and time performance bottlenecks

PUBLICATIONS

- 30 refereed papers presented at international conferences or published in scientific journals
- for a complete list of publications see <http://rohlik.org/papers/>
- papers relevant to space domain include
 - **COrDeT Cannes : Use of Domain Engineering Process to Develop Reusable Architectures and Building-Blocks** Rohlik O., Garcia G., Jung A., Olive X., Pasetti A., Rodríguez-Rodríguez A.-I., Stragapede A., Vardanega T. In proceedings of Data Systems In Aerospace (DASIA), Palma de Majorca, 2008
 - **A Methodology for Space Domain Engineering**, Rohlik O., Pasetti A., Rodríguez A.-I., Alaña E., Favaro J., Mazzini S. In proceedings of Data Systems In Aerospace (DASIA), Palma de Majorca, 2008
 - **An Integrated Metamodel Driven Process Focusing on Reuse and Correctness** Rohlik O., Bordin M., Panunzio M. In 27th Real Time Systems Symposium (RTSS), Rio de Janeiro, Brasil, 2006
 - **A UML2 Profile for Reusable and Verifiable Software Components for Real-Time Applications** Rohlik O., Vardanega T., Pasetti A., Cechticky V., Egli M. In Reuse of Off-the-Shelf Components (LCNS 4039), Springer, 2006
 - **A UML Profile for Designing Reusable and Verifiable Software Components for On-Board Applications** Rohlik O., Vardanega T., Pasetti A., Egli M. In proceedings of Data Systems In Aerospace (DASIA), Berlin, 2006
 - **Adapting Control Software Systems through Aspect-Oriented Programming** Rohlik O., Birrer I., Chevalley P. In proceedings of the 16th IFAC Congress, Prague, 2005
 - **Implementing Adaptability in Embedded Software through Aspect Oriented Programming** Rohlik O., Pasetti A., Čechtický V., Birrer I. In proceedings of IEEE conference on Mechatronics & Robotics 2004, Aachen, 2004
 - **XML-Based Feature Modelling** Čechtický V., Pasetti A., Rohlik O., Schaufelberger W. In proceedings of ICSR (LCNS 3107), Madrid, 2004
 - **An Aspect Weaver for Qualifiable Applications** Birrer I., Chevalley P., Pasetti A., Rohlik O. In proceedings of Data Systems In Aerospace (DASIA), Nice, 2004