Ondrej Rohlik

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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 four projects coordinated and/or funded by European Space Agency between 2003 and 2008. Since 2008 he holds a faculty position at the University of West Bohemia in Pilsen. In parallel he is consulting for privately held Swiss company operating in space sector. Currently he acts as an advisor at the Czech Ministry of Transport and serves in Czech delegation to European Space Agency (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 – Unit of Satellite Navigation
Advisor (from 2009, part-time) – http://www.mdcr.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, Taegerwilen, 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 certificationCo-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** *Rohlík O., Birrer I., Chevalley P.* In proceedings of the 16th IFAC Congress, Prague, 2005
  - **Implementing Adaptability in Embedded Software through Aspect Oriented Programming** *Rohlík 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., Rohlík O., Schaufelberger W.* In proceedings of ICSR (LCNS 3107), Madrid, 2004
  - **An Aspect Weaver for Qualifiable Applications** *Birrer I., Chevalley P., Pasetti A., Rohlík O.* In proceedings of Data Systems In Aerospace (DASIA), Nice, 2004

In Pilsen, 26th April 2009