Benedikt Becker

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benozol

Experience

2021- **Figly Inc.**, *Compiler engineer*, Remote.
Compiler optimizations, runtimes, Wasm

2021- **VAC4EU**, *Software consultant*, Remote.
Code harmonization for pharmacoepidemiological studies

2020-2021 **Scientific engineer**, *Inria Saclay*, France.
Verification of Ada/SPARK using Why3; runtime assertion checking for validation of counter-examples

2019 **Scientific engineer**, *Université Paris Sud*, France.
Verification of Java JML contracts using Why3; application to Parcoursup

2018–2019 **Postdoctoral researcher**, *Inria Saclay*, France.
CoLiS project: Formally verified, symbolic execution of Shell programs

2013–2017 **Scientific researcher**, *Erasmus University Medical Center*, Netherlands.
Representation, retrieval, and integration of vaccine information

2011–2012 **Scientific programmer**, *CNRS/IRILL*, France.
Contributions to the Ocsigen/Eliom web application framework

2007–2011 **Freelance software engineer**, *France & Germany*.
Web application development, tools for medical inference, and cognitive science research

2005–2008 **Teaching assistant**, *Albert-Ludwig-University*, Germany.
Lectures: Computer science I, Cognitive modelling, Formal methods and programming

2004–2011 **Studies of computer science and cognitive science**, *Albert-Ludwig-University*, Freiburg, Germany.

Theses

PhD

Title *Vaccine semantics*: Automatic methods for recognizing, representing, and reasoning about vaccine-related information

Website `http://benozol.mooo.com/pages/phd`

Description Information about vaccines is spread over different resources: Products and product information are available in product databases; electronic health records document the use of vaccines in coded representation; scientific studies assess the safety and efficiency; and public news and social media reflect and shape the public's opinion. This thesis proposes techniques for the automatic retrieval and integrating of vaccine information from these resources.

Supervisors Miriam Sturkenboom & Jan Kors

Date 2019

Master

Title *Bayesian rationality and spatial reasoning*

Description Bayesian rationality, a cognitive paradigm centering on the uncertainty of knowledge in human reasoning, is applied on two spatial inference tasks: cerdinal directions and Allen's interval calculus.

Supervisors Bernhard Nebel & Marco Ragni

Date 2011

Bachelor

Title *EasyOCaml* – More descriptive type error messages for OCaml

Description A constrained-based type checker for a subset of the OCaml language.

Date 2008

Supervisors Peter Thiemann & Stefan Wehr

Funding OCaml Summer Project, Jane St. Capital, New York, US

Publications

Explaining counterexamples with giant-steps assertion checking.
Benedikt Becker, Cláudio Belo Lourenço and Claude Marché.
F-IDE, 2021

Analysing installation scenarios of Debian packages.
Benedikt Becker, Nicolas Jeannerod, Claude Marché, Yann Régis-Gianas, Mihaela Sighireanu and Ralf Treinen.
TACAS, 2020

Ghost Code in Action: Automated Verification of a Symbolic Interpreter.
Benedikt Becker, Claude Marché.
VSTTE 2019

Alignment of vaccine codes using an ontology of vaccine descriptions.
Benedikt Becker, Jan Kors, Erik Mulligen, Miriam Sturkenboom.
Journal of Biomedical Semantics, 2022.

Identification and normalization of vaccine descriptions in scientific literature: A comparison between ontology-based and machine learning approaches..
Benedikt Becker, Miriam Sturkenboom, Jan Kors.
Submitted.

CodeMapper: semi-automatic coding of medical case definitions.
Benedikt Becker, Paul Avillach, Silvana Romio, Erik Mulligen, Daniel Weibel, Miriam Sturkenboom, Jan Kors.
Pharmacoepidemiology and drug safety, 2017

Extraction of chemical-induced diseases using prior knowledge and textual information.
Ewoud Pons + Benedikt Becker, Saber Akhondi, Zubair Afzal, Erik Van Mulligen, Jan Kors.
Database, 2016.

Evaluation of a multinational, multilingual vaccine debate.
Benedikt Becker, Heidi Larson, Jan Bonhoeffer, Erik Van Mulligen, Jan Kors, Miriam Sturkenboom.
Vaccine, 2016.

Preferences in Cardinal Direction.
Marco Ragni, Benedikt Becker.
Proceedings of the Cognitive Science Society, 2010.

Open-source software/contributions

2019 **Why3**, *Deductive program verification platform*.
Runtime assertion checking, validation of counter-examples (OCaml/Why3).
`https://www.why3.org/`

2019 **CoLiS language**, *Target language for the symbolic execution of Shell scripts*.
Language design, concrete and symbolic execution, verification (OCaml/Why3).
`https://github.com/colis-anr/colis-language/`

2017 **VaccO**, *An ontology of vaccines and two applications*.
Design and implementation (Java/OWL2).
`https://biosemantics.org/software/vacco`

2016 **CodeMapper**, *Semiautomatic coding of case definitions*.
Design and implementation (Java/Javascript).
`https://github.com/VAC4EU/Codemapper`

2012 **Ocsigen/Eliom**, *Ocsigen: Language extensions and libraries for client/server web-applications in OCaml*.
Contributions (OCaml).
`http://ocsigen.org/`

2008 **ABC Tool**, *Automatic classification of adverse events*.
Design and implementation (Java).
`https://www.brightoncollaboration.org/`

2008 **EasyOCaml**, *More descriptive error messages for OCaml*.
Design and implementation (OCaml).
`https://github.com/benozol/easyocaml`

Skills & interests

Natural language

German: native, English: proficient, French and Spanish: intermediate.

Programming language

Completed projects using Rust, OCaml, TypeScript, Ada, Why3, Java, Python, JavaScript, Scala, C++.

Scientific interest

Software verification, runtime-assertion checking, symbolic execution, constraint-based type inference, natural language processing, ontologies and reasoning, machine learning, compiler construction, cognitive modelling, syntax theory.