

Dr Basile STARYNKEVITCH `basile@starynkevitch.net`

senior Computer Science research engineer (PhD in CS)

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Expertise

design and implementation of domain specific languages (homoiconic, reflexive, meta-programmed); software architecture and implementation of DSL based systems

symbolic artificial intelligence

static source code analysis, compilation and garbage collection, distributed computing, Web technologies

mastering many programming languages (C, Ocaml, Ocsigen, C++, Go, Common Lisp, Scheme, Prolog, JavaScript, HTML5, shells, SQL, ...) and willing to learn more of them

highly technical Linux programming (system calls; and using Pthreads, GTK, Qt, Fltk, Sqlite, MySQL & PostGreSQL, Web or cloud programming, ...) and software architect

200K on StackOverflow (top 0.05% overall)

Significant achievements

- bismon (2018-..., work in progress). A free software persistent (homoiconic, reflexive, multi-threaded, collaborative, web-interfaced) monitor framework for whole program static source code analysis, generating GCC plugins (funded CHARIOT 2018-2020 and DECODER 2019-2021 H2020 projects). See github.com/bstarynk/ for bismon and clips-rules-gcc
- GCC MELT (2006-2017) design and implementation of a Lisp-like domain specific language to extend and customize the GCC (Gnu Compiler Collection) compiler for static source code analysis purposes; funded thru GGCC (ITEA8) and OpenGPU (French FUI) research projects
- GCC (2008-2014?) contributions to the free software GCC project (of more than five millions lines), notably its plugin infrastructure and (with Jérémie Salvucci) GTY-ed garbage collector. Good knowledge of GCC middle-end (Gimple & SSA) layer.
- INRIA 2004 - Sabbatical year in Cristal (Ocaml) team at INRIA, working on persistence and JIT compilation in Ocaml.
- POESIA (2002-2003) architect and technical coordinator of a free software, E.C. funded, internet content filtering project. Implemented in Ocaml its central monitor.
- TWO (1999-2001) a static source code analysis (European FP5) project : contributions to scalar lattices (abstract interpretation) & development of a specialized generational copying garbage collector for and in C++.
- research proposals submission of European and national (French) research proposals. Contribution to CHARIOT proposal (funded, running 2018-2020). With Armand Puccetti and Franck Védrine (CEA), driven and coordinated the DECODER proposal (funded in ICT-16 call of H2020, starting in Q1 2019, mixing static analysis of source code, machine learning, natural language processing). Driven and coordinated the OPENSLEDGE proposal (FETOPEN, mixing static analysis & NLP); GlobalGCC (ITEA8), OpenGPU (French FUI), POESIA (SIAP) etc...
- misc. contributed to other projects before 2000 (software engineering, symbolic artificial intelligence); list available upon request.

Work experience

- ENPC Part time teaching assistant (in 2020-2021) at École des Ponts et Chaussées, module TDLOG, under supervision of Professor Xavier CLERC, xavier.clerc@enpc.fr.
- CEA since october 1985, research engineer at CEA [French Alternatives Energies and Atomic Energy Commission]. 1985-1999 : in its DRN (direction des réacteurs nucléaires; nuclear reactors division); 1999-now : in its DRT (direction de la recherche technologique): technological research division). with some teaching experience at University Paris 6 in 2013.

INRIA in 2004, sabbatical year at INRIA [French National Institute for computer science and applied mathematics] (Cristal team)

Education

Doctorat **PhD in CS** (artificial intelligence), Paris Univ. 6 *LIP6* - december 1990: Doctorat de l'Université Paris 6. *Expliciter et Utiliser les Données et le Contrôle pour les Connaissances par des Métaconnaissances*. (explicit and use data and control for knowledge with metaknowledge).

DEA (Master's in CS, 1984) "diplôme d'études approfondies en informatique, LIARFA", Univ. Paris 6

ENS Cachan (1980-1985) graduated from **École Normale Supérieure de Cachan**¹, ("section A₁, mathématiques"). Also license and maîtrise de mathématiques at Université Paris 11 Orsay.

Open source software repositories

github.com/bstarynk/ (with both professional and personal projects)

gitlab.com/bstarynk/ (likewise)

refpersys.org is my pet open source artificial intelligence project (GPLv3+ licensed, for Linux), developed with others, building upon several ideas of the late Jacques Pitrat². I recommend reading his last book *Artificial Beings: the conscience of a conscious machine*³ and his blog on bootstrappingartificialintelligence.fr/. I want to find opportunities (and small funding, since in October 2020 it is still a hobby) to work part time on *RefPerSys* professionally and apply that project on difficult or ill-defined concrete problems related to e-health, e-learning, instrumentation, data analysis, smart cities, smart grids, robotics, semi-automatic decision making, digital twins, informal optimization problems. I am interested in presenting that *RefPerSys* project in conferences and seminars.

Significant publications

report (october 2018-2020) draft technical report: *Specialized Static Analysis tools for more secure and safer IoT software development (Bismon documentation)* draft D1.3 deliverable of CHARIOT

DSL2011 conf. (IFIP working conference on Domain Specific Languages, Bordeaux, sept.2011) *MELT - a Translated Domain Specific Language Embedded in the GCC Compiler*

GCC summit 2007 (july 2007, Ottawa) *Multi-Stage Construction of a Global Static Analyzer*

MetaOcaml 2004 workshop: *Ocamljit - a Faster Just-in-Time Ocaml implementation*

CORESA 2003 with Mohamed Daoudi: *Architecture du système Poesia de filtrage de contenu Internet* (architecture of the Poesia system for Internet content filtering)

WAPATV 2001 with Dominique Guilbaud, Eric Goubault, Anne Pacalet, and Franck Védrine: *A Simple Abstract Interpreter for Threat Detection and Test Case Generation*

hobby free software project **refpersys.org** (ongoing, in artificial intelligence). With others.

Interested in

Learning more and training others about recent techniques in machine learning, deep learning, artificial intelligence, cloud computing, web technologies, software engineering, domain specific languages, Linux -from embedded systems to web and cloud computing- and applying and combining them cleverly, perhaps with meta-programming and symbolic processing (e.g. using some of *TensorFlow*, *Gudhi*, *MapReduce*, *OpenStack*, *CouchDb*, *Cassandra*, *Ocsigen*, etc...) for **solving challenging real-life software-intensive problems**.

¹ENS Cachan is moving in 2019 and renamed as École Normale Supérieure de Paris-Saclay.

²(1934-oct.2019)

³Wiley, ISTE, 2009, ISBN 978-1848211018

teaching software engineering and development (OSes, cybersecurity, AI, programming languages, databases, semantics, embedded software ...) to students or junior professionals (with LINUX) in France or nearby.

Either **free-lancing** or somehow **partly remote** (working from home, near Paris, France, even part-time) jobs : **Linux software development, design, debugging, and architecture** (embedded, Web, cloud, artificial intelligence, cybersecurity, maybe open source), **code review**, cybersecurity evaluations, technical training.

Some remote from-home working, at 80% full-time, to allocate one working day each week to work on the refpersys.org project.

Member of

the following French organizations: **APRIL** (free software), **AFUL** (Linux), **AFIA** (artificial intelligence). Notice that I never used any flavor of MicroSoft Windows.

Identity

Basile Starynkevitch ♂

born on August 1st, 1959 (61 years old in August 2020), at 12000 RODEZ, France; *French citizen*

male, married, father & grand-father; speaking French, English, Russian

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