

Tomáš Křen

Programmer / Researcher / Dreamer

Location: Prague, Czech Republic
Email: tomkren@gmail.com
Phone: +420 776 147 881
WWW: tomkren.cz
Github: <https://github.com/tomkren>



Overview

I am a computer science PhD student at the Charles University in Prague focusing on computational intelligence, with the main interest in strongly typed genetic programming. In my work I am trying to connect the inductive problem solving capabilities of genetic programming with deductive approach found in mathematical logic via functional programming type systems. So far I am a co-author of 10 published papers, including one winning a best student paper award at ICTAI 2016. The most notable application of our approach is a system for automatic creation of machine learning workflows. I consider myself to be a skilled programmer with solid mathematical background. I am looking for a job in the video game industry or in an AI related position.

Professional Interests

- Genetic programming**
- Computer games**
- Functional programming**
- Artificial intelligence**
- Machine learning**
- Type theory and logic**

Education

since 2013

Doctoral Studies

*Charles University in Prague, Faculty of Mathematics and Physics
Computer Science - Theoretical Computer Science*

Thesis subject: Genetic Programming in Typed Languages

Advisor: Mgr. Roman Neruda, CSc.

2011 - 2013

Master Studies

*Charles University in Prague, Faculty of Mathematics and Physics
Computer Science - Theoretical Computer Science*

Study program: Non-Procedural Programming and Artificial Intelligence

Thesis subject: Typed Functional Genetic Programming

Graduation with honours.

2007 - 2011

Bachelor Studies

*Charles University in Prague, Faculty of Mathematics and Physics
Computer Science - Programming*

Thesis subject: Tool for programming in a physical environment

2003 - 2007

High School

Gymnázium Christiana Dopplera, Prague

Programming Skills

Active work with (at least one larger project):

Java

Haskell

Web technologies (JavaScript, HTML, CSS, PHP, SQL)

Python

Also some experience with (small, unfinished or older projects):

C#

C/C++

Work in unix environment and server management

NoSQL

Prolog

Matlab

Lisp

Foreign Languages

English - active knowledge

Experience

- 2015-17** Recipient of research grant for project “Genetic Programming in Typed Languages”, resulted in 8 publications, one of them winning a best student paper award.
- 2014-17** Teaching at Charles University in Prague, Faculty of Mathematics and Physics (lecture *Functional Programming*, seminars *Programming I & Non-procedural programming*)
- 2017** Personal tutoring mathematical logic and computer science
- 2017** Member of winning team in an architectural competition involving evolution of pavement patterns using genetic programming and cellular automata.
- 2013** A bit of freelance web/mobile app programming
(Collaboration on frontend for an internal questionnaire app for a market research company.)
- 2010** Service technician - AutoCont

Other Interests

- Philosophy**
- Nature**
- Drawing**
- Writing**
- Hiking and Skiing**
- Social life**
- Lego and Raspberry Pi**
- Lucid dreaming**

Publications

[10] Automatic Creation of Machine Learning Workflows with Strongly Typed Genetic Programming

Tomáš Křen, Martin Pilát, Roman Neruda

International Journal on Artificial Intelligence Tools, Volume 26, Issue 05, October 2017

[9] Combining Top-Down and Bottom-Up Approaches for Automated Discovery of Typed Programs

Tomáš Křen, Josef Moudřík, Roman Neruda

IEEE SSCI 2017 (November 27 - December 1 2017, Honolulu, USA)

[8] Multi-Objective Evolution of Machine Learning Workflows

Tomáš Křen, Martin Pilát, Roman Neruda

IEEE SSCI 2017 (November 27 - December 1, Honolulu, USA)

[7] Algorithm Discovery with Monte-Carlo Search: Controlling the Size

Josef Moudřík, Tomáš Křen, Roman Neruda

IEEE ICTAI 2017 (November 6-8 2017, Boston, USA)

[6] Asynchronous Evolution of Data Mining Workflow Schemes by Strongly Typed Genetic Programming

Martin Pilát, Tomáš Křen, Roman Neruda

IEEE ICTAI 2016 (November 6-8 2016, San Jose, USA).

[5] Evolving Workflow Graphs Using Typed Genetic Programming.

Tomáš Křen, Martin Pilát, Roman Neruda

IEEE SSCI 2015, (December 8-10 2015, Cape Town, South Africa)

[4] A Dynamic Programming Approach to Individual Initialization in Genetic Programming

Tomáš Křen, Roman Neruda

IEEE SMC 2015 (October 9-12 2015, Hong Kong)

[3] Generating Workflow Graphs Using Typed Genetic Programming

Tomáš Křen, Martin Pilát, K. Pešková, R. Neruda

Workshop MetaSel ECMD PKDD 2015 (September 7 2015, Porto)

[2] Utilization of reductions and abstraction elimination in typed genetic programming

Tomáš Křen, Roman Neruda

In Proceedings of the 2014 conference on Genetic and evolutionary computation (GECCO '14). ACM, 943-950.

[1] Generating lambda term individuals in typed genetic programming using forgetful A*

Tomáš Křen, Roman Neruda

In Proceedings of the 2014 IEEE Congress on Evolutionary Computation (CEC). IEEE, 1847-1854.