Marko Vasic

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Work Experience

Facebook — **Menlo Park, CA, U.S.**
Software Engineering Intern, Big Code Team — *June 2019–September 2019*
Code Autocompletion Tool using Program Synthesis
- Designed pipeline for data collection, preprocessing and cleaning from large corpus of proprietary Java code.
- Leveraged machine learning techniques and custom feature engineering.
- Achieved top–1 prediction accuracy over 85% on predicting variables of function call arguments.

Google — **Mountain View, CA, U.S.**
Software Engineering Intern, Google Brain Team — *May 2018–August 2018*
Technique for Automated Bug Localization and Program Repair
- Designed pipeline for data collection, preprocessing and cleaning from 150,000 Python files.
- Designed novel deep learning method for bug localization and repair.
- Correctly repaired 65% of synthetically produced variable misuse bugs.
- Published at ICLR 2019 [arxiv.org/pdf/1904.01720.pdf] (one of the major machine learning conferences).

Microsoft — **Redmond, WA, U.S.**
Research Intern, Tools for Software Engineers Team — *June 2017–August 2017*
Integration of Lazy File Materialization (LFM) into Microsoft's Distributed Build System
- The build system fetches more files than needed for a build due to the underspecified dependencies, I integrated LFM that ensures only files that will be actually used are fetched.
- Achieved up to $5x$ decrease in the disk usage of builds, while preserving the build time.
- Proposed a hybrid model: prefetch files used in the previous commit and use LFM, to decrease both disk usage and build time.

Nordeus — **Belgrade, Serbia**
Software Engineer — *2013–2015*
Top Eleven—Soccer Manager Game [www.topeleven.com]
- Developed (from scratch) new version of soccer manager game Top Eleven.
- Supported major platforms (iOS, Android, Web) with a single code base (significantly reducing cost of development and maintenance).
- Top Eleven active since 2010 and still counts millions of monthly active users.

Education

The University of Texas at Austin — **Austin, TX, U.S.**
PhD in Electrical and Computer Engineering — *2016–present*
GPA: 4.0

The University of Texas at Austin — **Austin, TX, U.S.**
MSc in Electrical and Computer Engineering — *2016–2018*
GPA: 4.0

The University of Belgrade — **Belgrade, Serbia**
BSs in Electrical and Computer Engineering — *2010–2014*
GPA: 9.87 out of 10; Ranked 1st among 120 computer engineering students

Selected Projects

Molecular Programming
CRN++: Molecular Programming Language — *2018*
- Designed the first imperative molecular programming language.
- Published paper [arxiv.org/pdf/1809.07430.pdf] and open-sourced the language [github.com/marko-vasic/crnPlusPlus].

Regression Test Selection
File-Level vs. Module-Level Regression Test Selection for .NET — *2017*
- Built regression test selection tool for C#.
- Integrated into Microsoft build system.
- Reduced testing time for 43% on open source and for 65% on Microsoft projects.
- Published paper [par.nsf.gov/servlets/purl/10055459] and open-sourced the tool [github.com/marko-vasic/ekstaziSharp].

Selected Publications

Marko Vasic, Cameron Chalk, Sarfraz Khurshid, and David Soloveichik. Deep Molecular Programming: A Natural Implementation of Binary-Weight ReLU Neural Networks. In *International Conference on Machine Learning*, 2020.

Marko Vasic, David Soloveichik, and Sarfraz Khurshid. CRNs Exposed: Systematic Exploration of Chemical Reaction Networks. In *International Conference on DNA Computing and Molecular Programming*, 2020 (**Best Student Paper Award**).

Marko Vasic, Andrija Petrovic, Kaiyuan Wang, Mladen Nikolic, Rishabh Singh, and Sarfraz Khurshid. MoËT: Mixture of Expert Trees and its Application to Verifiable Reinforcement Learning. `https://arxiv.org/pdf/1906.06717.pdf`.

Muhammad Usman, Wenxi Wang, Kaiyuan Wang, **Marko Vasic**, Haris Vikalo, and Sarfraz Khurshid. A Study of the Learnability of Relational Properties (Model Counting Meets Machine Learning). In *Programming Language Design and Implementation*, 2020.

Marko Vasic, Aditya Kanade, Petros Maniatis, David Bieber, and Rishabh Singh. Neural Program Repair by Jointly Learning to Localize and Repair. In *International Conference on Learning Representations*, 2019.

Marko Vasic, David Soloveichik, and Sarfraz Khurshid. CRN++: Molecular Programming Language. In *International Conference on DNA Computing and Molecular Programming*, 2018.

Ahmet Celik, **Marko Vasic**, Aleksandar Milicevic, and Milos Gligoric. Regression Test Selection Across JVM Boundaries. In *International Symposium on Foundations of Software Engineering*, 2017.

Marko Vasic, Zuhair Parvez, Aleksandar Milicevic, and Milos Gligoric. File-Level vs. Module-Level Regression Test Selection for .NET. In *International Symposium on Foundations of Software Engineering*, 2017.

Awards

- **Best Student Paper Award** at DNA conference [`www.dna-computing.org/award.html`] - 2020
- Cockrell School of Engineering Fellowship - 2020
- James William Stewart, Jr. Endowed Scholarship in Electrical and Computer Engineering - 2019 and 2020
- Douglas Wilson Fellowship in Electrical and Computer Engineering - 2018
- **Best Student in Class Award** at The University of Belgrade - 2014
- Scholarship, Government of the Republic of Serbia - 2014
- Scholarship, Government of the City of Belgrade - 2010, 2012, 2013
- Third Prize at **Serbian National Competition in Mathematics** - 2010
- Third Prize at **Serbian National Competition in Informatics** - 2010
- Honorable Mention at **Serbian National Competition in Physics** - 2004

Technical Skills

Fluent in Java, C#, Python, bash programming, version control (git), Alloy (functional programming language). Familiar with C++, C, Coq (theorem prover), Tensorflow, Theano.

Teaching Assistance

- **The University of Texas at Austin** — **Austin, TX, U.S.**
  Algorithmic Foundations for Software Systems — *2019*
  Graduate level course introducing students to fundamental computer science algorithms.
- **The University of Texas at Austin** — **Austin, TX, U.S.**
  Verification and Validation of Software — *2018*
  Graduate level course introducing students to software verification and validation techniques.
- **The University of Texas at Austin** — **Austin, TX, U.S.**
  Advanced Programming Tools — *2017*
  Graduate level course introducing students to myriad of tools used in industrial software engineering process.
- **The University of Belgrade** — **Belgrade, Serbia**
  Programming — *2011*
  Lab assistant on courses covering C and C++ programming languages

Professional Service

Paper Co-Reviewer

Read, evaluated and graded papers submitted to conferences.

- 2021: FSE (Foundations of Software Engineering)
- 2021: MSR (International Conference on Mining Software Repositories)
- 2020: ICST (International Conference on Software Testing, Verification and Validation)
- 2019: ICSE (International Conference on Software Engineering)
- 2018: ISSTA (International Symposium on Software Testing and Analysis), FSE (Foundations of Software Engineering)
- 2017: ISSTA (International Symposium on Software Testing and Analysis), ASE (International Conference on Automated Software Engineering)

Visa Status

Permanent resident of the United States of America.