

## Jiri Gesi

PhD Student

fjiriges@uci.edu

<https://www.linkedin.com/in/jiriges/>

+1 (313) 265 - 9195

Jiri is currently a Research Assistant at the Software Engineering & Testing Using Artificial Intelligence for Reliable Software (*STAIRS*) lab within the ICS department at UC Irvine. He works with Prof. Iftekhhar Ahmed. His main research interests are Software Engineering for Machine Learning (SE4ML), Machine Learning for Software Engineering (ML4SE), Natural Language Analysis, Mutation Analysis, and Program Analysis.

### Experience

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#### **University of California, Irvine - Research Assistant (Sep. 2019 - Now)**

Research direction: machine learning for software engineering, machine learning fairness

Advisor: Dr. Iftekhhar Ahmed

#### **eBay - Funded Research Collaborator (Mar. 2021 - Dec. 2021)**

Research direction: Bug report/ticket closing time prediction

Supervisor: Joontae Park

#### **Ford Motor Company - ML Engineer (Dec. 2017 - Aug. 2019)**

Research direction: Anomaly detection

Supervisor: Matt Holmes

#### **University of Michigan - Research Assistant (Jan. 2016 - Dec. 2017)**

Research direction: Programming analysis, mutation analysis, genetic algorithm, design optimization

Advisor: Dr. Marouane Kenssenti

### Publications

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**Jiri Gesi**, Jiawei Li, Iftekhhar Ahmed, “An Empirical Examination of the Impact of Bias on Just-in-time Defect Prediction”, *the 15<sup>th</sup> ACM/IEEE International Symposium on Empirical Software Engineering and Measurement* in 2021. (Acceptance rate of 19.4%)

Alex Groce, Iftekhhar Ahmed, Josselin Feist, Gustavo Grieco, **Jiri Gesi**, Mehran Meidani, “Evaluating and Improving Static Analysis Tools Via Differential Mutation Analysis”, *the 21<sup>st</sup> IEEE International Conference on Software Quality, Reliability, and Security in 2021*. (Acceptance rate of 25.10%)

**Jiri Gesi**, Hanzhang Wang, Bochang Wang, Andrew Truelove, Joontae Park, Iftekhhar Ahmed, “Will We Fix the bug in Time? An Empirical Study at eBay”, under submission

**Jiri Gesi**, Siqi Liu, Jiawei Li, Iftekhhar Ahmed, Nachiappan Nagappan, Eduardo Santana de Almeida, David Lo, “An Exploratory Study of Code Smells in Machine Learning Applications”, under submission

Clay Stevens, **Jiri Gesi**, Sasan Azizian, Iftekhhar Ahmed, Hamid Bagheri, “Finding Optimal Database Design Tradeoffs with Graph Neural Networks”, under submission

### Selected Projects

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#### **Bug Tickets Lifetime Prediction (eBay) - CNN, RNN, Bert, Activity features**

- Complement the existing work by investigating features that can improve the bug resolution time prediction performance specifically in the context of industrial software systems.
- Introduced a set of Activity features, novel CNN based team reassignment path representation feature, LSTM-based activity representation feature, and comment sentiment representation features to improve the prediction performance.

#### **Just-in-time commit level defect prediction - RNN, Siamese Network,**

- Empirically validate a set of commit characteristics that potentially bias the defect prediction performance based on edit change representation for each Git commit.

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- Introduced an end-to-end deep learning framework (SifterJIT) based on RNN and Siamese Network towards improving the prediction performance for few-shot and biased part of commits.

#### **Finding optimal database design tradeoffs - GNN**

- Introduced a novel solution employing Gated Graph Neural Network to efficiently and scalable find and present the best tradeoffs among database designs for object-oriented software systems.
- Trained the GNN model on a set of previously evaluated database designs and uses that model to predict a subset of designs most likely to contain the best tradeoffs, providing a much smaller number of design candidates for dynamic evaluation.
- Those candidates can then be evaluated and compared, with the designs providing the best tradeoffs presented to the user in a fraction of the time required for state-of-the-art, brute force analyses.

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### ***Education***

#### **University of California, Irvine 2019 - ongoing**

Ph.D. Software Engineering

Advisor: Iftekhhar Ahmed

Coursework: Machine learning, Statistical NLP, Statistics Methodology, Generative Models

#### **University of Michigan 2016 - 2017**

M.S. Computer Science

Coursework: Software architecture, Software testing, Programming analysis

#### **Xi'an Jiao Tong University, China 2012 - 2016**

B.S. Mechanical Engineering

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### ***Service***

#### **Reviewer:**

Empirical Software Engineering Journal, 2021

#### **Volunteer:**

The 42nd International Conference on Software Engineering, June 24, 2020 – July 16, 2020

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### ***Awards***

Dean's Awards from Donald Bren School of Information and Computer Sciences, 2019 (\$ 5,000)

Excellent Master Thesis, University of Michigan (2017)

Siyuan Scholarship, Xi'an Jiao Tong University, China (2013, 2014, 2015) (\$ 2,000)

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### ***Skills***

Python, Java, R, Machine learning, Natural language process, Program Analysis, Statistics, Software analysis