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Markos Viggiato

Highlights of Qualifications

- Proven record of research collaboration with different research groups (papers [P2, P3, P4, P7, P9])
- Co-reviewer for top-tier software engineering journal (IEEE Transactions of Software Engineering) and magazine (IEEE Software)
- Worked as teaching assistant for four undergraduate level courses
- Research expertise: applied data analytics and applied machine learning, with a focus on computer game analytics and software analytics
- Technical expertise: Natural Language Processing (sentiment analysis), prediction and explanatory machine learning models, unstructured data processing, and statistical modelling

Education

Jan-2019–Present **PhD in Electrical and Computer Engineering**, *University of Alberta*, Edmonton, Canada.
- Data Science applied to computer games
- GPA: 4.0 (out of 4.0)

Mar-2017–Dec-2018 **Masters in Computer Science**, *Federal University of Minas Gerais*, Belo Horizonte, Brazil.
- Machine Learning for Software Engineering
- GPA: 9.0 (out of 10.0)

Mar-2011–Dec-2016 **Bachelor in Control and Automation Engineering**, *Federal University of Minas Gerais*, Belo Horizonte, Brazil.
- GPA: 7.6 (out of 10.0)

Selected Peer-Reviewed Publications

P1 **Viggiato M.**, Bezemer, C. **Trouncing in Dota 2: An Investigation of Blowout Matches**. In AAAI Conference on Artificial Intelligence and Interactive Digital Entertainment (AIIDE), Oct 2020 (7 pages).

P2 **Viggiato M.**, Lin D., Hindle A., Bezemer, C. **What Causes Wrong Sentiment Classifications of Game Reviews?** IEEE Transactions on Games (under review), 2020 (12 pages).

P3 Mariano R. V. R., Santos G. E., **Viggiato M.**, Brandao W. C. **Feature changes in source code for commit classification into maintenance activities**. In IEEE International Conference on Machine Learning and Applications (ICMLA), Dec 2019 (4 pages). Acceptance rate: 14%.

P4 **Viggiato, M.**, Oliveira, J., Figueiredo, E., Jamshidi, P., Kastner, C. **How Do Code Changes Evolve in Different Platforms? A Mining-based Investigation**. In IEEE International Conference on Software Maintenance and Evolution (ICSME), Oct 2019 (5 pages). Acceptance rate: 23.5%.

P5 Oliveira, J., **Viggiato, M.**, Figueiredo, E. **How Well Do You Know This Library? Mining Experts from Source Code Analysis**. In 18th Brazilian Software Quality Symposium (SBQS), Oct 2019 (10 pages) (**Best paper award**).

P6 **Viggiato, M.**, Oliveira, J., Figueiredo, E., Jamshidi, P., Kästner, C. **Understanding similarities and differences in software development practices across domains**. In IEEE International Conference on Global Software Engineering (ICGSE), May 2019 (11 pages). Acceptance rate: 39.5%.

P7 **Viggiato, M.**, Terra, R., Rocha, H., Valente, M. T., Figueiredo, E. **Microservices in Practice: A Survey Study**. In VI Workshop on Software Visualization, Evolution and Maintenance (VEM), Sep 2018 (8 pages).

P8 Oliveira, J., **Viggiato, M.**, Santos, M. F., Figueiredo, E., Marques-Neto, H. **An Empirical Study on the Impact of Android Code Smells on Resource Usage**. In 30th International Conference on Software Engineering and Knowledge Engineering (SEKE), Jul 2018 (6 pages). Acceptance rate: 35%.

P9 Mori, A., Vale, G., **Viggiato, M.**, Oliveira, J., Figueiredo, E., Cirilo, E., Jamshidi, P., Kastner, C. **Evaluating domain-specific metric thresholds: an empirical study**. In IEEE/ACM International Conference on Technical Debt (TechDebt), May 2018 (10 pages).

P10 **Viggiato, M.**, Tavares, C. S., de Oliveira, J. A., Figueiredo, E. **On the Investigation of Domain-Sensitive Bad Smells in Information Systems**. INFOCOMP Journal of Computer Science, Dec 2017 (11 pages).

Awards

- Alberta Innovates Graduate Student Scholarship (Jan 2020 - present). 3-year duration scholarship. The Alberta Innovates Graduate Student Scholarship is designed to enable promising students to succeed in Platform Areas of scientific research which are strategically important to Alberta
- Alberta Graduate Excellence Scholarship (AGES) (Sep 2019). The AGES Scholarship recognizes outstanding academic achievement of students pursuing graduate studies in Alberta
- Early Career Researcher Award (Sep 2019) provided by the Faculty of Graduate Studies and Research - University of Alberta
- Registration sponsorship for the International Conference on Software Engineering, Montreal, Canada (May 2019)
- Brazilian government award for exchange at Trinity College Dublin, Ireland (2014–2015)
- Travel grant for the BAJA SAE automotive engineering competition at the Rochester Institute of Technology, USA, (Jun 2013)

Research Experience

Jan-2019–Present **PhD Researcher**, *University of Alberta*.
Research in applied Machine Learning and data analytics using computer game data **(Python, Java, R)**

- Built explainable win prediction models (XGBoost, Random Forest, Logistic Regression) for Dota 2 using SHAP values and achieved a performance of 86%.
- Implemented a sentiment analysis classification pipeline to analyze 12M of game reviews. Identified key problems that degrade the sentiment analysis performance, with a potential performance improvement of up to 11%.
- Collaborated on a project to model the helpfulness of computer game reviews on the Steam platform using the Random Forest algorithm.

Jan-2017–Dec-2018 **MSc Researcher**, *Federal University of Minas Gerais*.
Research in applied machine learning and data mining for software engineering **(Python, Java, R)**

- Implemented algorithms to mine and process software repositories from GitHub.
- Built models to classify commits into maintenance activities using machine learning algorithms, which increased the state-of-the-art accuracy by 5%.
- Collaborated on a project to build explainable prediction models for software defects using XGBoost and SHAP values and improved the prediction accuracy by 15%.

Jan-2016–Dec-2016 **Undergraduate Researcher**, *Federal University of Minas Gerais*.
Research in software reuse and software quality **(Java, R, HTML, CSS)**

- Developed efficient heuristics in Java using greedy algorithms to configure products in software product lines.
- Investigated software quality factors for e-commerce, health, and game domains.

Sep-2013–Dec-2015 **Undergraduate Researcher & Developer**, *Federal University of Minas Gerais*.
Development of a remote vibration monitoring system for hydroelectric plants of energy companies **(LabVIEW, MATLAB, C++)**

- Developed efficient algorithms for data acquisition, data processing, and vibration analysis using the LabVIEW platform.

Teaching Experience

2020 **ECE220**, *University of Alberta*, Graduate assistant of Programming for Electrical Engineering, 174 students.

2019 **ECE321**, *University of Alberta*, Graduate assistant of Software Requirements Engineering, 44 students.

2018 **DCC603**, *Federal University of Minas Gerais*, Graduate assistant of Software Engineering, 40 students.

2012 **MAT001**, *Federal University of Minas Gerais*, Undergraduate assistant of Calculus I, 50 students.

Industrial Experience

Jan-2016–Apr-2016 **Engineering Intern**, *Centre Suisse d'Electronique et de Microtechnique - Brazil*.
Participated in the development of new technologies for flexible solar panels.

- Developed algorithms in C++ for data acquisition and data processing.
- Delivered a temperature and humidity complete monitoring system using Arduino microcontroller.

Professional Services

- Co-reviewer for the IEEE Transactions on Software Engineering

- Co-reviewer for the IEEE Software
- Co-reviewer for the Ibero-American Conference on Software Engineering
- Organizing member of the 6th Computer Science Summer School, *Federal University of Minas Gerais*, Brazil, 2017

Additional Information

Leadership positions

- Weekly seminar organizer in the Software Engineering research laboratory during the masters, 2017–2018
- Selected as competition team leader in the Baja SAE engineering competition in the USA, 2013

Online Courses

- Programming for Everybody (Getting Started with Python), 2019 (**University of Michigan**)
- Machine Learning, 2018 (**Stanford University**)
- Object Oriented Programming in Java, 2016 (**University of California, San Diego**)

Other Skills

- Programming languages: Python, R, Java, Matlab, C, C++
- Experience with project management, JUnit, git, RESTful API, MySQL, MVC architecture, bash script, Linux environment, Google Cloud servers, JSON, Jupyter Notebook, machine learning models, scikit-learn framework

References

- Dr. Cor-Paul Bezemer (bezemer@ualberta.ca), University of Alberta, Canada
- Dr. Eduardo Figueiredo (figueiredo@dcc.ufmg.br), Federal University of Minas Gerais, Brazil