Miguel Velez

Ph.D. Student in Software Engineering

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*"I never want to reach the point in my life where I've already
done the most epic thing I will ever do" -Anonymous*

Education

2016 - Present	**Doctor of Philosophy in Software Engineering**, *Carnegie Mellon University*, Pittsburgh, PA, USA Advisor: Christian Kästner. Thesis Topic: White-Box Performance Analysis of Configurable Systems. (Expected Graduation: Fall 2021)
2016 - 2020	**Master of Software Engineering**, *Carnegie Mellon University*, Pittsburgh, PA, USA
2010 - 2015	**Bachelor of Arts in Computer Science (Physics minor)** , *University of St. Thomas*, St. Paul, MN, USA Summa Cum Laude. Major and Minor GPA: 4.00/4.00. Cumulative GPA: 3.99/4.00. Advisor: Patrick Jarvis. Summa Cum Laude paper: "Current and Future Relationships Between Robots and Humans"

Industry Experience

Full-time

2016	**Application Developer/Software Engineer**, *Sportradar US*, Minneapolis, MN, USA Developed a Ruby ETL application that provided data for the NFL Radar360 research tool

Internships

Summer 2021	**Software Engineering Intern**, *Google*, Remote, USA Designed and developed a CLI tool to run performance regression analyzers on historical data
Summer 2020	**Software Engineering Intern**, *Google*, Remote, USA Collected and surfaced metrics corresponding to RPC behavior during integration tests
Summer 2019	**Software Engineering Intern**, *Google*, Sunnyvale, CA, USA Designed and implemented a data federation GraphQL layer in CDAP/Cloud Data Fusion
Summer 2018	**Software Engineering Intern**, *Google*, Mountain View, CA, USA Improved Suggest's ranking of contact actions in the Android Google Search App
Fall 2015	**Application Developer/Software Engineer**, *Sportradar US*, Minneapolis, MN, USA Built a Ruby monitoring application to parse and build Formula 1 feeds
Spring 2015	**Jr. Application Developer**, *SportsData/Sportradar US*, Minneapolis, MN, USA Implemented a Ruby application to parse and build MLB feeds
2013 - 2014	**Cloud Developer Intern**, *Valtira*, Minneapolis, MN, USA Developed web applications with Java servlets, AngularJS, and MySQL databases

Research Experience

2016 - Present	**Graduate Research Assistant**, *Carnegie Mellon University*, Pittsburgh, PA, USA
Spring 2019	**Teaching Assistant - Analysis of Software Artifacts (Graduate course)**, *Carnegie Mellon University*, Pittsburgh, PA, USA
Fall 2018	**Teaching Assistant - Foundations of Software Engineering (Undergraduate course)**, *Carnegie Mellon University*, Pittsburgh, PA, USA
Summer 2015	**Research Intern**, *Massachusetts Institute of Technology*, Cambridge, MA, USA
2014 - 2015	**Undergraduate Student Researcher**, *University of St. Thomas*, St. Paul, MN, USA

Publications

Refereed Journal Articles

[1] **M. Velez**, P. Jamshidi, F. Sattler, N. Siegmund, S. Apel, and C. Kästner. "ConfigCrusher: Towards White-Box Performance Analysis for Configurable Systems". In *Autom Softw Eng* (2020).

Refereed Conference Publications

[5] **M. Velez**, P. Jamshidi, N. Siegmund, S. Apel, and C. Kästner. "White-Box Analysis over Machine Learning: Modeling Performance of Configurable Systems". In *Proc. Int'l Conf. Software Engineering (ICSE)*. Madrid, Spain: IEEE, May 2021. (23% acceptance rate).

[4] P. Jamshidi, **M. Velez**, C. Kästner, and N. Siegmund. "Learning to Sample: Exploiting Similarities Across Environments to Learn Performance Models for Configurable Systems". In *Proc. Int'l Symp. Foundations of Software Engineering (FSE)*. Lake Buena Vista, FL, USA: ACM, Nov. 2018, pp. 71–82. (21% acceptance rate).

[3] P. Jamshidi, N. Siegmund, **M. Velez**, C. Kästner, A. Patel, and Y. Agarwal. "Transfer Learning for Performance Modeling of Configurable Systems: An Exploratory Analysis". In *Proc. Int'l Conf. Automated Software Engineering (ASE)*. Urbana-Champaign, IL, USA: ACM, Oct. 2017. (21% acceptance rate).

[2] P. Jamshidi, **M. Velez**, C. Kästner, N. Siegmund, and P. Kawthekar. "Transfer Learning for Improving Model Predictions in Highly Configurable Software". In *Proc. Int'l Symp. Software Engineering for Adaptive and Self-Managing Systems (SEAMS)*. Buenos Aires, Argentina: IEEE, May 2017, pp. 31–41. (23% acceptance rate).

[1] **M. Velez**, J. Sawin, A. Ingerson, and D. Chiu. "Improving Bitmap Execution Performance Using Column-Based Metadata". In *Int'l Conf. Future Internet of Things and Cloud (Fi-Cloud)*. Vienna, Austria: IEEE, Aug. 2016, pp. 371–378. (30% acceptance rate).

Technical Reports

[1] **M. Velez**, P. Jamshidi, F. Sattler, N. Siegmund, S. Apel, and C. Kästner. *ConfigCrusher: Towards White-Box Performance Analysis for Configurable Systems*. Tech. rep. 1905.02066v2. arXiv, July 2020.

Ph.D. Thesis Proposal

[1] **M. Velez**. *White-box Analysis for Modeling and Debugging the Performance of Configurable Systems*. Dec. 2020.

Miscellaneous

[7] **M. Velez**, P. Jamshidi, C. Kästner, N. Siegmund, F. Sattler, and S. Apel. *White-Box Performance Discovery*. Poster. Google PhD Intern Research Conference. Sunnyvale, CA, USA, July 2019.

[6] **M. Velez**, P. Jamshidi, C. Kästner, N. Siegmund, F. Sattler, and S. Apel. *White-Box Performance Discovery*. Poster. BRASS PI Meeting. Seattle, WA, USA, Nov. 2017.

[5] **M. Velez** and J. Sawin. *Improving the Efficiency of CHA through Parallelization*. Poster. Inquiry at St. Thomas. St. Paul, MN, USA, May 2016.

[4] **M. Velez** and J. Sawin. *Faster WAH Compression Querying through the Use of Metadata*. Poster. Consortium for Computing Sciences in Colleges Midwest Region. 1st place Discovery Track. Evansville, IN, USA, Oct. 2015.

[3] **M. Velez** and A. Solar-Lezama. *Simpler Implementation of Sketches through Enhanced Expressiveness*. Poster. MIT Summer Research Poster Session. Cambridge, MA, USA, Aug. 2015.

[2] **M. Velez**. *Current and Future Relationships Between Robots and Humans*. Summa Cum Laude Paper. Apr. 2015.

[1] **M. Velez**, P. Gittins, and J. Sawin. *Extending SMILES to Encode Reaction Mechanisms*. Poster. Inquiry at St. Thomas. St. Paul, MN, USA, May 2014.

Awards and Honors

2019	**CMU's ISR Presidential Fellowship**. $50,000
2015	**MSRP Research Internship at MIT**. Acceptance rate: 10.5%
2015	**CCSC:MW 1st place Student Posters & Showcase Discovery Track**. $100
2015	**UST Student Travel Grant**. $750
2014, 2015	**UST Collaborative Inquiry Grant**. $2,000
2012	**UST International Student Leadership Scholarship**. $500
2011 - 2015	**Bev and Pat Flaherty Scholarship**. $14,000
2010 - 2015	**University of St. Thomas International Scholarship**. $80,000
2010 - 2015	**University of St. Thomas Tuition Scholarship**. 40% discount
2008 - 2009	**American Field Service International Scholarship**.

Service

Committees

2019 - 2021	MIT Summer Research Program Application Review
2019	CMU ISR-SE Ph.D. Admissions
2017	CMU REU-SE Admissions

Reviewing

2021	JSS Reviewer
2020	TSE Reviewer

Sub-Reviewing

2020	ASE'20 Sub-Reviewer
2019	ICSE'20 Sub-Reviewer
2019	ASE'19 Sub-Reviewer
2019	ESEC/FSE'19 Sub-Reviewer
2018	ICSE-NIER'19 Sub-Reviewer
2017	ICSE'18 Sub-Reviewer
2017	ASE'17 Sub-Reviewer
2017	ESEC/FSE'17 Sub-Reviewer
2016	ICSE'17 Sub-Reviewer

Other Interests and Activities

2018 - 2021	Hispanic Googler Network
2014 - 2015	UST Game Design Club
2013, 2015	Note taker. Helped two students with disabilities to take notes in class
2012 - 2015	UST Computer Science Consultant
2011 - 2015	UST Computer Science Club
2010 - 2015	UST Globally Minded Student Association
2012 - 2013	St. Thomas Activities and Recreation President
2011 - 2012	St. Thomas Activities and Recreation Intern
2010 - 2012	UST Spanish Tutor
2011	2 STEM Learning Communities
2010 - 2011	UST Morrison Hall Council

References

Christian Kästner
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Carnegie Mellon University
✉ kaestner [at] cs.cmu.edu

Justin Bishop
Performance Testing
Google
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Mark Wakabayashi
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Pooyan Jamshidi
Computer Science and Engineering
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