ThanhVu (Vu) Huy Nguyen's
Curriculum Vitae

Department of Computer Science
George Mason University
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Bio: *ThanhVu (Vu) Nguyen is an associate professor in Computer Science and the director of the MS Software Engineering program at George Mason University. He completed his Ph.D. in Computer Science at the University of New Mexico-Albuquerque and a postdoc at the University of Maryland-College Park.*

Nguyen's research lies at the intersection of Software Engineering and Formal Methods, focusing on safety of AI and correctness of programs. He is the recipient of the NSF CAREER Award, the NSF CRII Award, an Amazon Research Award, and three Test-of-Time paper awards: an IEEE TSE Most Influential Paper of the Decade Award, an ACM SIGSOFT ICSE 10-year Most Influential Paper Award, and an ACM SIGEVO 10-year Impact Award.

1 Education and Employment History

1.1 Academic Positions

- Dept. of Computer Science, George Mason University (GMU)
  - **Associate Prof. (tenured)** 2024–present
  - **Program Director**, MS in Software Engineering 2023–present
  - Assistant Prof. 2021–2024
- Assistant Prof., Computer Science & Engr., University of Nebraska-Lincoln (UNL) 2016–2021
- Postdoc, Computer Science, University of Maryland, College Park, MD 2014–2016

  Mentor: Jeff Foster

1.2 Industrial and Government Positions

- Internships, Naval Research Laboratory 2004–2025, 2006, 2012–2013

  Three 8-month internships in the Information Technology and Tactical Electronic Warfare divisions

  Produced *twelve* peer-reviewed conference and journal papers, and received an *Incentive Award* from the Navy
- Internship, Advanced Technology Laboratories, Lockheed Martin 2007

1.3 Academic Degrees

- **PhD**, Computer Science, University of New Mexico, Albuquerque, NM 2007–2014

  Advisers: Stephanie Forrest and Deepak Kapur
- **MS**, Computer Science, Penn State University, Harrisburg, PA 2003–2006

  Adviser: Thang N. Bui
- **BS**, Computer Science, Penn State University, University Park, PA 1999–2003

- **High School**
  - Bishop McDevitt, Harrisburg, PA 1997–1999
  - McKinley High School, Honolulu, HI 1995–1997

2 Research

Software Engineering; Formal Methods; Programming Languages; Automated Reasoning; Software Testing and Verification; Neural Networks Verification; Dynamic Invariant Generation

2.1 Awards and Honors

- Nominee, GMU Teaching Excellence Award, GMU 2026
- Best Paper Award [C2], SSBSE 2025
- Spotlight Paper Award [C3], NeurIPS 2025
- Nvidia Academic Grant [G1], NVIDIA 2025
- **Most Influential Paper Award** [J11], IEEE 2025

  Named *"One of the most influential papers of TSE's 4th decade"*, Trans. on Software Engineering (TSE)
- **NeuralSAT** ranked *2nd overall*, VNN-COMP 2025
- **NeuralSAT** ranked *2nd overall*, VNN-COMP 2024
- **NeuralSAT** ranked *4th overall* and received the **New Participant Award**, VNN-COMP 2023
- **Amazon Research Award** [G4] (Automated Reasoning), Amazon Science 2023
- **Faculty Early Career Development (CAREER) Award** [G5], NSF 2023
- **CISE Research Initiation Initiative (CRII) Award** [G9], NSF 2020
- **10-year Most Influential Paper Award** [C35], ACM/SIGSOFT and IEEE/TCSE 2019

  Most influential paper published at the 2009 Int. Conf. on Software Engineering (ICSE)
- **10-year Impact Award** [C37], ACM/SIGEVO 2019

  Highest impact paper published at the 2009 Conf. on Genetic and Evolutionary Computation (GECCO)
- Sigma Xi "Excellence in Graduate Research", UNM 2014

  Voted on by the faculty of the College of Engineering at UNM. Awarded annually to *one graduate student* with outstanding research record
- Dean's Dissertation Fellowship, $8K, UNM 2012–2013

  Voted on by the faculty of UNM. Awarded annually to *two graduating students* based on academic achievements
- Distinguished Paper Award [C34], Int. Conf. on Software Engineering 2012
- Featured Article [J11], IEEE Transactions on Software Engineering 2012
- Research Highlight [J12], Communication of ACM 2010
- Distinguished Paper Award [C35], Int. Conf. on Software Engineering 2009

- **IFIP TC2 Manfred Paul Award for Excellence in Software: Theory and Practice**, $1024, Int. Conf. on Software Engineering 2009

  Given annually across multiple conferences to individuals who have made exceptional contributions to the advancement of software research and practice

- Best Paper Award (Ant Colony Optimization & Swarm Intelligence Track) [C36] Genetic and Evolutionary Computation Conf. 2009

- Best Paper Award (Genetic Programming Track) [C37], Genetic and Evolutionary Computation Conf. 2009

- **ACM SIGEVO "Humies" Gold Medal Award**, $10K, ACM SIGEVO 2009

  For human-competitive results produced by genetic and evolutionary computation

- Best Paper and Presentation [W3], $270, Workshop on Search-Based Software Testing 2009

- Walter Karplus Research Grant, $2.3K, IEEE Computational Intelligence Society 2009

  Summer scholarship grant for graduate students with promising research projects

- Graduate Research Fellowship, $15K, NASA (SpaceGrant) 2008–2010

- Outstanding Submission [W4], High Performance Embedded Computing Workshop 2007

- Best Paper Award [C43], Int. Conf. on Informatics in Control Automation and Robotics 2006

- Incentive Award, Naval Research Laboratory (NRL) 2005

  Award given for internship at NRL (2 peer-reviewed conference papers for work performed during the first 6 months [C49, C48] and in total 12 conference and journal papers in 2 years)

2.2 Research Funding

9 grants (5 NSF, 1 Defense, 2 Industry Gifts, 1 Internal)

Total: $2,804,587, **my share**: $1,563,455; **as PI**: $1,404,605

At GMU: $2,086,420; **my/GMU share**: $1,236,428; **as PI**: $1,236,428

G1 Nguyen (sole PI). *NVIDIA Academic Grant Program.* 2025, DGX Spark System. NVIDIA

G2 Nguyen (PI@GMU) and Kapur (PI@UNL). *FMitF: Track II: Collaborative Research: FMitF: Track II: From Theory to Practice: Making Complex Invariants Accessible with DIG.* NSF 2422036. 9/1/2024–8/31/2026, $149986 (my portion: $99246). NSF

G3 Nguyen (sole PI). *FMitF: Track II: Cybolic: A Symbolic Execution Technique and Tool for Analyzing CMake Build Scripts.* NSF 2319131. 7/1/2023–1/30/2025, $97,242. NSF

G4 Nguyen (sole PI). *Amazon Research Award (Automated Reasoning): Scalable and Precise DNN Constraint Solving with Abstraction and Conflict Clause Learning.* 2023, $50,000 unrestricted gift. Amazon

G5 Nguyen (sole PI). *CAREER: NeuralSAT: A Constraint-Solving Framework for Verifying Deep Neural Networks.* NSF 2238133. 8/1/2023–7/31/2028, $510,509. NSF

G6 Nguyen (sole PI). *Analysis of CMake Build files using Symbolic Execution.* 2021, $30,000 unrestricted gift. Facebook/WhatsApp

G7 Nguyen (PI@GMU), Koskinen (PI@Stevens), Le (Co-PI@Stevens), and Antonopoulos (PI@Yale). *Collaborative: Medium: Ensuring Safety and Liveness of Modern Systems through Dynamic Temporal Analysis*. NSF 2107035; 2200621. 7/15/2021–7/14/2024, $1,199,871 (sole PI at GMU, my portion: $399,879). NSF

Supplementary REU: $16,000

G8 Nguyen (sole PI). *Faculty Seed Grant: Analyzing Highly-Configurable Software*. 2021, $10K. UNL

G9 Nguyen (sole PI). *CRII: Analyzing Linux KBuild Makefiles*. NSF 1948536; 2304748. 4/1/2020–3/31/2022, $174,975. NSF

Transferred $32,768 to GMU

Supplementary REU: $16,000

G10 Dwyer (PI) and Nguyen (Co-PI). *Predictive Failure Avoidance*. ARO (W911NF1910054). 2018–2021, $549,990 (my portion: $158,850). Army Research Office

2.3 Publication Record

Google Scholar: citations 4317, h-index 20, i10-index 33 (as of July 2025).

Refereed papers: journal 12, conference 38, workshop 4.

[1], [2], [3] denote co-authorship with my undergraduate, MS, and PhD students, respectively.

2.3.1 Under Submission

1. Hai Duong[3], Linhan Li[3], ThanhVu Nguyen, and Matthew Dwyer. *A DPLL(T) Framework for Verifying Deep Neural Networks*. journal, 25 pages. 2023. arXiv: `2307.10266 [cs.LG]`

2. Yuandong Cyrus Liu, Ton-Chanh Le, Timos Antonopoulos, Eric Koskinen, and ThanhVu Nguyen. *DrNLA: Extending Verification to Non-linear Programs through Dual Re-writing*. journal, 30 pages. 2023. arXiv: `2306.15584 [cs.PL]`

2.3.2 Books

B1 ThanhVu Nguyen and Hai Duong. *Introduction to Neural Network Verification*. Ongoing work. URL: `https://roars.dev/nnv/book.pdf`

B2 ThanhVu Nguyen. *SAFE: Software Analysis and Formal rEasoning*. Ongoing work. URL: `https://nguyenthanhvuh.github.io/class-oo/safe.pdf`

B3 ThanhVu Nguyen. *Demystifying PhD Admissions in Computer Science: A Handbook for Navigating CS PhD Admissions in the U.S*. Open-source version available at `https://code.roars.dev/phd-cs-us/`. Amazon Kindle Direct Publishing, open-source. URL: `https://www.amazon.com/dp/B0F41HP6Y2`

2.3.3 Refereed Journal Papers (in print)

J1 Hai Duong[3], Thanh Le, Nguyen Lam, and ThanhVu Nguyen. "Verifying Structural Robustness of Deep Neural Network". In: *Proceedings of the ACM on Software Engineering (PACMSE)* FSE (2026). PDF, to appear

J2 Claire Le Goues, ThanhVu Nguyen, Stephanie Forrest, and Westley Weimer. "The Evolution of Automated Software Repair". In: *IEEE Transactions on Software Engineering* (2025). PDF

J3 Hai Duong[3], Dong Xu, ThanhVu Nguyen, and Matthew Dwyer. "Harnessing Neuron Stability to Improve DNN Verification". In: *Proceedings of the ACM on Software Engineering (PACMSE)* 1.FSE (2024). PDF, pages 859–88125%

J4 Guangjing Wang, Nikolay Ivanov, Bocheng Chen, Qi Wang, ThanhVu Nguyen, and Qiben Yan. "Graph Learning for Interaction Analysis in Smart Home Rule Data". In: *Proceedings of the ACM on Management of Data (SIGMOD)* (2023). PDF, pages 1–27

J5 Thanhvu Nguyen, KimHao Nguyen[1], and Matthew Dwyer. "Using Symbolic States to Infer Numerical Invariants". In: *Transactions on Software Engineering (TSE)* 48.10 (2021). PDF, 3877—3899. Impact Factor 9.3

J6 Didier Ishimwe[3], KimHao Nguyen[1], and ThanhVu Nguyen. "Dynaplex: analyzing program complexity using dynamically inferred recurrence relations". In: *Proceedings of the ACM on Programming Languages* 5.(OOPSLA) (2021). PDF, pages 1–23

J7 TonChanh Le, Timos Antonopoulos, Parisa Fathololumi, Eric Koskinen, and ThanhVu Nguyen. "DynamiTe: Dynamic Termination and Non-termination Proofs". In: *Proceedings of the ACM on Programming Languages* 4.(OOPSLA) (2020). PDF, pages 1–30

J8 Benjamin Mariano, Josh Reese, Siyuan Xu, ThanhVu Nguyen, Xiaokang Qiu, Jeffrey S Foster, and Armando Solar-Lezama. "Program Synthesis with Algebraic Library Specifications". In: *Proceedings of the ACM on Programming Languages* 3.(OOPSLA) (2019). PDF, pages 1–25

J9 ThanhVu Nguyen, Deepak Kapur, Westley Weimer, and Stephanie Forrest. "DIG: A Dynamic Invariant Generator for Polynomial and Array Invariants". In: *Transactions on Software Engineering Methodology (TOSEM)* 23.4 (2014). PDF, 30:1–30:30. Impact Factor 2.07

J10 Deepak Kapur, Zhihai Zhang, Matthias Horbach, Hengjun Zhao, Qi Lu, and ThanhVu Nguyen. "Geometric Quantifier Elimination Heuristics for Automatically Generating Octagonal and Max-plus Invariants". In: *Automated Reasoning and Mathematics: Essays in Memory of William W. McCune*. Volume 7788. PDF. Springer, 2013, pages 189–228.

J11 Claire Le Goues, ThanhVu Nguyen, Stephanie Forrest, and Westley Weimer. "Genprog: A Generic Method for Automatic Software Repair". In: *Transactions on Software Engineering (TSE)* 38.1 (2011). PDF, pages 54–72. Impact Factor 9.3

Most Influential Paper Award (received in 2025)

Featured Article

1.4K+ citations

J12 Westley Weimer, Stephanie Forrest, Claire Le Goues, and ThanhVu Nguyen. "Automatic Program Repair with Evolutionary Computation". In: *Communications of the ACM (CACM)* 53.5 (2010). PDF, pages 109–116. Impact Factor 14.07

Research Highlight

500+ citations

J13 Thang Bui, ThanhVu Nguyen, Chirag Patel, and Kim-Anh Phan. "An Ant-based Algorithm for Coloring Graphs". In: *Discrete Applied Mathematics* 156.2 (2008). PDF, pages 190–200. Impact Factor 0.99

100+ citations

J14 James F Smith III and ThanhVu H Nguyen. "Autonomous and cooperative robotic behavior based on fuzzy logic and genetic programming". In: *Integrated Computer-Aided Engineering* 14.2 (2007). PDF, pages 141–159.

2.3.4 Refereed Conference Papers (in print)

C1 Hai Duong[3], Thanh Le, Nguyen Lam, and ThanhVu Nguyen. "Verifying Neural Network Robustness with Dual Perturbations". In: *International Conference on Computer Vision and Pattern Recognition (CVPR)*. PDF. 2026, to appear

C2 Didier[3] Ishimwe and ThanhVu Nguyen. "LLM-Guided Fuzzing for Pathological Input Generation". In: *International Symposium on Search Based Software Engineering*. PDF. Springer. 2025, to appear

Best Paper Award

C3 Hai Duong[3], David Shriver, ThanhVu Nguyen, and Matthew Dwyer. "Compositional Neural Network Verification via Assume-Guarantee Reasoning". In: *Advances in Neural Information Processing Systems (NeurIPS)*. PDF. 2025, to appear

Spotlight Paper

C4 Hai Duong[3], ThanhVu Nguyen, and Matthew Dwyer. "Generating and Checking DNN Verification Proofs". In: *Advances in Neural Information Processing Systems (NeurIPS)*. PDF. 2025, to appear

C5 Linhan Li[3] and ThanhVu Nguyen. "Destabilizing Neurons to Generate Challenging Neural Network Verification Benchmarks". In: *Automated Software Engineering (ASE)*. PDF. IEEE, 2025, to appear

C6 Hai Duong[3] and ThanhVu Nguyen. "Neuralsat: Scaling constraint solving for dnn verification (competition contribution)". In: *International Symposium on AI Verification*. PDF. Springer. 2025, pages 253–259

C7 Stefania Piciorea[1] and ThanhVu Nguyen. "Bringing Invariant Analysis to modern IDEs: The DIG+ Extension for VS Code". In: *International Symposium on Software Testing and Analysis (ISSTA)-Tool Demo*. PDF. ACM, 2025, pages 51–55

C8 Linhan Li[3] and ThanhVu Nguyen. "COOLer: A Language Support Extension for COOL in VS Code". In: *International Symposium on Software Testing and Analysis (ISSTA)-Tool Demo*. PDF. ACM, 2025, pages 11–15

C9 Hai Duong[3], ThanhVu Nguyen, and Matthew Dwyer. "NeuralSAT: A High-Performance Verification Tool for Deep Neural Networks". In: *Computer Aided Verification (CAV)*. PDF. 2025, pages 409–423

C10 Long Doan[3] and ThanhVu H Nguyen. "AI-Assisted Autoformalization of Combinatorics Problems in Proof Assistants". In: *International Conference on Software Engineering (ICSE)-New Ideas and Emerging Results (ICSE-NIER)*. PDF. 2025, pages 1–5

C11 Tung Dao, Na Meng, and ThanhVu Nguyen. "Triggering Modes in Spectrum-Based Multi-Location Fault Localization". In: *Foundations of Software Engineering (FSE)-Industry Track*. PDF. 2023, pages 1774–1785

C12 Quoc-Sang Phan, KimHao Nguyen[1], and ThanhVu Nguyen. "The Challenges of Shift Left Static Analysis". In: *International Conference on Software Engineering (ICSE)-Software Engineering in Practice (ICSE-SEIP)*. PDF. IEEE, 2023, pages 340–342

C13 Simón Gutierrez Brida, Germán Regis, Guolong Zheng[3], Hamid Bagheri, ThanhVu Nguyen, Nazareno Aguirre, and Marcelo Frias. "ICEBAR: Feedback-Driven Iterative Repair of Alloy Specifications". In: *Automated Software Engineering (ASE)*. PDF. ACM, 2022, pages 1–13. Acceptance 22%

C14 Guolong Zheng[3], ThanhVu Nguyen, Simón Gutiérrez Brida, Germán Regis, Marcelo Frias, Nazareno Aguirre, and Hamid Bagheri. "ATR: Template-based Repair for Alloy Specifications". In: *International Symposium on Software Testing and Analysis (ISSTA)*. PDF. ACM, 2022, pages 666–677. Acceptance 26.6%

C15 KimHao Nguyen[1], ThanhVu Nguyen, and Quoc-Sang Phan. "Analyzing the CMake Build System". In: *International Conference on Software Engineering (ICSE)-Software Engineering in Practice (ICSE-SEIP)*. PDF. IEEE, 2022, pages 27–28

C16 Thanh-Dat Nguyen, Thanh Le-Cong, ThanhVu H Nguyen, Xuan-Bach D Le, and Quyet-Thang Huynh. "Toward the Analysis of Graph Neural Networks". In: *International Conference on Software Engineering (ICSE)-New Ideas and Emerging Results (NIER)*. PDF. 2022, pages 116–120. Acceptance 28%

C17 Didier Ishimwe[3], KimHao Nguyen[1], and ThanhVu Nguyen. "Dynaplex: Inferring Asymptotic Runtime Complexity of Recursive Programs". In: *International Conference on Software Engineering (ICSE)-Tool Demo*. PDF. IEEE, 2022, pages 61–64. Acceptance 50%

C18 ThanhVu Nguyen, KimHao Nguyen[1], and Hai Duong[3]. "SymInfer: Inferring Numerical Invariants using Symbolic States". In: *International Conference on Software Engineering (ICSE)-Tool Demo*. PDF. IEEE, 2022, pages 197–201. Acceptance 50%

C19 KimHao Nguyen[1] and ThanhVu Nguyen. "GenTree: Using decision trees to learn interactions for configurable software". In: *International Conference on Software Engineering (ICSE)*. PDF. IEEE, 2021, pages 1598–1609. Acceptance 22%, artifact evaluation

C20 Guolong Zheng[3], ThanhVu Nguyen, Simón Gutiérrez Brida, Germán Regis, Marcelo F Frias, Nazareno Aguirre, and Hamid Bagheri. "FLACK: Counterexample-guided fault localization for alloy models". In: *International Conference on Software Engineering (ICSE)*. PDF. IEEE, 2021, pages 637–648. Acceptance 22%, artifact evaluation

C21 Simón Gutierrez Brida, Germán Regis, Guolong Zheng[3], Hamid Bagheri, ThanhVu Nguyen, Nazareno Aguirre, and Marcelo Frias. "Bounded exhaustive search of alloy specification repairs". In: *International Conference on Software Engineering (ICSE)*. PDF. IEEE, 2021, pages 1135–1147. Acceptance 22%, artifact evaluation

C22 KimHao Nguyen[1] and ThanhVu Nguyen. "GenTree: Inferring Configuration Interactions using Decision Trees". In: *Automated Software Engineering (ASE)-Tool Demo*. PDF. IEEE, 2021, pages 1232–1236. Acceptance 47%

C23 Guolong Zheng[3], ThanhVu Nguyen, Simón Gutiérrez Brida, Germán Regis, Marcelo F Frias, Nazareno Aguirre, and Hamid Bagheri. "FLACK: Localizing Faults in Alloy Models". In: *Automated Software Engineering (ASE)-Tool Demo*. PDF. IEEE, 2021, pages 1218–1222. Acceptance 47%

C24 Simón Gutierrez Brida, Germán Regis, Guolong Zheng[3], Hamid Bagheri, ThanhVu Nguyen, Nazareno Aguirre, and Marcelo Frias. "BeAFix: An Automated Repair Tool for Faulty Alloy Models". In: *Automated Software Engineering (ASE)-Tool Demo*. PDF. IEEE, 2021, pages 1213–1217. Acceptance 47%

C25 ThanhVu Nguyen and KimHao Nguyen[1]. "Using Symbolic Execution to Analyze Linux KBuild Makefiles". In: *International Conference on Software Maintenance and Evolution*. PDF. IEEE, 2020, pages 712–716. Acceptance 37%

C26 Guolong Zheng[3], Hamid Bagheri, and ThanhVu Nguyen. "Debugging Declarative Models in Alloy". In: *2020 IEEE International Conference on Software Maintenance and Evolution*. PDF. IEEE, 2020, pages 844–848

C27 TonChanh Le, Guolong Zheng[3], and ThanhVu Nguyen. "SLING: Using Dynamic Analysis to Infer Program Invariants in Separation Logic". In: *Programming Language Design and Implementation (PLDI)*. PDF. ACM, 2019, pages 788–801. Acceptance 27%

C28 Paul Gazzillo, Ugur Koc, Thanhvu Nguyen, and Shiyi Wei. "Localizing Configurations in Highly-Configurable Systems". In: *International Systems and Software Product Line Conference (Challenge Track)*. PDF. 2018, pages 269–273

C29 ThanhVu Nguyen, Matthew Dwyer, and William Visser. "SymInfer: Inferring Program Invariants using Symbolic States". In: *Automated Software Engineering (ASE)*. PDF. IEEE, 2017, pages 804–814. Acceptance 21%

C30 ThanhVu Nguyen, Timos Antonopoulos, Andrew Ruef, and Michael Hicks. "Counterexample-guided approach to finding numerical invariants". In: *Foundations of Software Engineering (FSE)*. PDF. 2017, pages 605–615. Acceptance 24%

C31 ThanhVu Nguyen, Deepak Kapur, Westley Weimer, and Stephanie Forrest. "Connecting Program Synthesis and Reachability: Automatic Program Repair using Test-Input Generation". In: *International Conference on Tools and Algorithms for the Construction and Analysis of Systems (TACAS)*. PDF. Springer, 2017, pages 301–318. Acceptance 28%

C32 ThanhVu Nguyen, Ugur Koc, Javran Cheng, Jeffrey S. Foster, and Adam A. Porter. "iGen: Dynamic Interaction Inference for Configurable Software". In: *Foundations of Software Engineering (FSE)*. PDF. ACM, 2016, pages 655–665. Acceptance 27%

C33 ThanhVu Nguyen, Deepak Kapur, Westley Weimer, and Stephanie Forrest. "Using Dynamic Analysis to Generate Disjunctive Invariants". In: *International Conference on Software Engineering (ICSE)*. PDF. IEEE, 2014, pages 608–619. Acceptance 20%

C34 ThanhVu Nguyen, Deepak Kapur, Westley Weimer, and Stephanie Forrest. "Using Dynamic Analysis to Discover Polynomial and Array Invariants". In: *International Conference on Software Engineering (ICSE)*. PDF. IEEE, 2012, pages 683–693. Acceptance 21%

100+ citations

Distinguished Paper Award

C35 Westley Weimer, ThanhVu Nguyen, Claire Le Goues, and Stephanie Forrest. "Automatically Finding Patches Using Genetic Programming". In: *International Conference on Software Engineering (ICSE)*. PDF. IEEE, 2009, pages 364–367. Acceptance 12%

10-year Most Influential Paper Award (received in 2019)

1K+ citations

Distinguished Paper Award

IFIP TC2 Manfred Paul Award for Excellence in Software: Theory and Practice

C36 Thang Bui, ThanhVu Nguyen, and Joseph Rizzo Jr. "Parallel Shared Memory Strategies For Ant-based Optimization Algorithms". In: *Conference on Genetic and Evolutionary Computation (GECCO)*. PDF. ACM, 2009, pages 1–8. Acceptance 41%

Best Paper Award

C37 Stephanie Forrest, ThanhVu Nguyen, Westley Weimer, and Claire Le Goues. "A genetic programming approach to automated software repair". In: *Conference on Genetic and Evolutionary Computation (GECCO)*. PDF. 2009, pages 947–954. Acceptance 41%

10-year Impact Award (received in 2019)

300+ citations

Best Paper Award

C38 James Smith III and ThanhVu Nguyen. "Fuzzy Decision Trees for Planning and Autonomous Control of a Coordinated Team of UAVs". In: *International Society for Optical Engineering*. PDF. SPIE, 2007

C39 James Smith III and ThanhVu Nguyen. "Genetic Program based Data Mining of Fuzzy Decision Trees and Methods of Improving Convergence and Reducing Bloat". In: *International Society for Optical Engineering*. PDF. SPIE, 2007

C40 Thang N Bui and ThanhVu H Nguyen. "An Agent-based Algorithm for Generalized Graph Colorings". In: *Conference on Genetic and Evolutionary Computation (GECCO)*. PDF. 2006, pages 19–26. Acceptance 46%

C41 James Smith III and ThanhVu Nguyen. "Guiding Genetic Program Based Data Mining Using Fuzzy Rules". In: *Intelligent Data Engineering and Automated Learning (IDEAL)*. PDF. Springer, 2006, pages 1337–1345

C42 James Smith III and ThanhVu Nguyen. "Evolutionary Data Mining Approach to Creating Digital Logic". In: *International Conference on Informatics in Control Automation and Robotics (ICINCO)*. PDF. Springer, 2006, pages 107–113

C43 James Smith III and ThanhVu Nguyen. "Fuzzy Logic Based Resource Manager for a Team of UAVs". In: *Annual Meeting of the North American Fuzzy Information Processing Society (NAFIPS)*. PDF. IEEE, 2006, pages 463–470

Best Paper Award

C44 James Smith III and ThanhVu Nguyen. "Fuzzy Logic Based UAV Allocation and Coordination". In: *International Conference on Informatics in Control Automation and Robotics (ICINCO)*. PDF. Springer, 2006, pages 81–94

C45 James Smith III and ThanhVu Nguyen. "Creating Fuzzy Decision Algorithms Using Genetic Program Based Data Mining Program". In: *Annual Meeting of the North American Fuzzy Information Processing Society (NAFIPS)*. PDF. IEEE, 2006, pages 471–477

C46 James Smith III and ThanhVu Nguyen. "Resource Manager for an Autonomous Coordinated Team of UAVs". In: *International Society for Optical Engineering*. PDF. SPIE, 2006, pages 118–129

C47 James Smith III and ThanhVu Nguyen. "Genetic Program based Data Mining to Reverse Engineer Digital Logic". In: *International Society for Optical Engineering*. PDF. SPIE, 2006, pages 24–35

C48 James Smith III and ThanhVu Nguyen. "Distributed Autonomous Systems: Resource Management, Planning, and Control Algorithms". In: *International Society for Optical Engineering*. PDF. SPIE, 2005, pages 65–76

C49 James Smith III and ThanhVu Nguyen. "Data Mining based Automated Reverse Engineering and Defect Discovery". In: *International Society for Optical Engineering*. PDF. SPIE, 2005, pages 232–242

2.3.5 Refereed Workshop Papers (in print)

W1 ThanhVu Nguyen, Didier Ishimwe[3], Alexey Malyshev[2], Timos Antonopoulos, and Quoc-Sang Phan. "Using Dynamically Inferred Invariants to Analyze Program Runtime Complexity". In: *International Workshop on Software Security from Design to Deployment*. PDF. 2020, pages 11–14

W2 Guolong Zheng[3], Quang Loc Le, ThanhVu Nguyen, and Quoc-Sang Phan. "Automatic Data Structure Repair using Separation Logic". In: *Java PathFinder Workshop*. PDF. 2018, pages 66–66

W3 ThanhVu Nguyen, Westley Weimer, Claire Le Goues, and Stephanie Forrest. "Using Execution Paths to Evolve Software Patches". In: *International Conference on Software Testing, Verification and Validation Workshops*. PDF. IEEE, 2009, pages 152–153

Best Paper Award

Best Presentation Award

W4 G Viamontes, M Amduka, J Russo, Craven M, and T Nguyen. "Efficient Memoization Strategies for Object Recognition with a Multi-Core Architecture". In: *Annual High Performance Embedded Computing Workshop*. PDF. IEEE, 2007

Outstanding Submission

2.3.6 Dissertation

T1 ThanhVu Nguyen. "Automating Program Verification and Repair Using Invariant Analysis and Test-input Generation". PDF. PhD thesis. University of New Mexico, Aug. 2014

Pass with Distinction

Sigma Xi Award

Dean's Dissertation Fellowship

T2 ThanhVu Nguyen. "On the Graph Coloring Problem and Its Generalizations". PDF. Master's thesis. The Pennsylvania State University, Dec. 2006

2.3.7 Patents

- Hamid Bagheri, Thanhvu Nguyen, and Guolong Zheng. "Systems, methods, and media for fault localization in declarative specification languages". Patent US Patent App. 17/887,827. Feb. 2023

2.3.8 Publicly Available Software

S1 *CSPicks: A Webapp to Explore CS Programs and Professors*. URL: `https://roars.dev/cspicks`

S2 *CSConfs: A Webapp Showing CS Conferences Deadlines*. URL: `https://roars.dev/csconfs`

S3 Hai Duong and ThanhVu Nguyen. *The NeuralSAT Verification Tool for Deep Neural Networks*. URL: `https://code.roars.dev/neuralsat`

- ranked **2nd overall** at VNN-COMP'25
- ranked **2nd overall** at VNN-COMP'24
- ranked **4th overall** at VNN-COMP'23 and received the *"New Commer Award"*

S4 ThanhVu Nguyen. *The DIG (Dynamic Invariant Generation) System*. URL: `https://code.roars.dev/dig`

S5 Thanhvu Nguyen and Thang Bui. *DIMACS benchmarks repository: collections of benchmark instances for NP-hard problem*. URL: `https://code.roars.dev/npbench`

2.4 Invited Talks

T1 W. Weimer, C. Le Goues, T. Nguyen, S. Forrest. "It Does What You Say, Not What You Mean: Lessons From A Decade of Program Repair"

Plenary Sessions: Most Influential Paper, Int. Conf. on Software Engineering (ICSE), 2019

T2 "Scalable DNN Verification using Constraint Solving"

Virginia Tech (Northern VA campus), Fall 2022

Michigan State University, Fall 2022

T3 "Improving Software Quality using Automatic Invariant Discovery and Program Repair"

Summer School on Formal Techniques, SRI, Spring 2021

CS Seminar, George Mason University, Spring 2021

CS Seminar, University of Nebraska-Lincoln, Spring 2016

CS Seminar, Auburn, Spring 2016

Galois, Spring 2016

CS Seminar, Virginia Tech, Spring 2014

2.5 Media Coverage

M1 GMU. *George Mason's ROARS lab retains its ranking as a leader in AI safety at the 2024 International Neural Network Verification Competition.* https://cec.gmu.edu/news/2025-05/george-masons-roars-lab-retains-its-ranking-leader-ai-safety-2024-international-neural. 2025

M2 GMU. *Amazon Research Award Win Ai Safety Verification.* https://cec.gmu.edu/news/2023-07/amazon-research-award-win-ai-safety-verification. 2023

M3 Amazon Science. *79 Amazon Research Awards recipients announced.* https://www.amazon.science/research-awards/program-updates/79-amazon-research-awards-recipients-announced. 2023

M4 Thanh Nien News VN. *Tien Si Goc Viet Duoc Tai Tro Nghien Cuu AI.* https://thanhnien.vn/tien-si-goc-viet-duoc-tai-tro-nghien-cuu-ai-185230304234603638.htm. 2023

M5 GMU. *Boom crash: Mason researcher receives half million NSF grant that could steer AI safely.* https://www.gmu.edu/news/2023-02/boom-crash-mason-researcher-receives-half-million-nsf-grant-could-steer-ai-safely. 2023

M6 UNL. *Nguyen earns NSF CRII award.* https://computing.unl.edu/nguyen-earns-nsf-crii-award/. 2020

M7 UNL. *Nguyen earns ICSE 2019 Most Influential Paper Award.* https://computing.unl.edu/nguyen-earns-icse-2019-most-influential-paper-award/. 2019

3 Teaching and Student Advising

3.1 Courses

Course Rating: out of 5

† denote a new course I developed

- CS 695/SWE 699 (Special Topic): Deep Neural Network Verification† Fall'25

Enrollment 10, Responses 8, Instr. Rating 4.88, Course Rating 4.85

- SWE 619: OO Software Specification and Construction Spring'25

  Enrollment 25, Responses 15, Instr. Rating 4.8, Course Rating 4.8

- SWE 419: OO Software Specification and Construction Fall'24

  Enrollment 28, Responses 20, Instr. Rating 4.2, Course Rating 4.2

- SWE 619: OO Software Specification and Construction Spring'24

  Enrollment 28, Responses 25, Instr. Rating 4.4, Course Rating 4.6

- CS 695/SWE 699 (Seminar): AI Safety and Assurance† Fall'23

  Enrollment 29, Responses 24, Instr. Rating 4.8, Course Rating 4.7

- SWE 619 Online Course Development† Fall'22

  Developed an online version of the SWE 619 course with Wiley publishing. Course launched in Spring'23 and taught every semester.

- SWE 419: OO Software Specification and Construction Fall'22

  Enrollment 16, Responses 16, Instr. Rating 4.4, Course Rating 4.5

- SWE 619: OO Software Specification and Construction Spring'22

  Enrollment 33, Responses 17, Instr. Rating 4.3, Course Rating 4.3

- SWE 619: OO Software Specification and Construction Fall'21

  Enrollment 32, Responses 7, Instr. Rating 3.86, Course Rating 3.86 (Online class due to COVID)

- CSCE 990: Software Verification Seminar† (graduate, enrollment 4) Spring'21
- CSCE 425: Compiler Construction† (undergraduate, enrollment 8) Spring'21
- CSCE 467/861: Software Testing, Verification, and Analysis† (undergraduate, enrollment 15) Fall'20
- CSCE 425: Compiler Construction† (graduate and undergraduate, enrollment 11) Spring'20
- CSCE 990: Software Verification Seminar† (graduate, enrollment 4) Spring'20
- CSCE 467/861: Software Testing, Verification, and Analysis† (undergraduate) Fall'19
- CSCE 990: Software Verification Seminar† (graduate) Spring'19
- SOFT 260: Software Engineering III (undergraduate) Fall'18
- CSCE 428: Automata, Computation, and Formal Languages (graduate) Spring'18
- CSCE 990: Software Verification Seminar† (graduate) Fall'17
- CSCE 428: Automata, Computation, and Formal Languages (graduate) Spring'17
- CSCE 990: Software Verification Seminar† (graduate) Fall'16

3.2 Student Advising

3.2.1 Current

- Nguyen Khoi (PhD student) Fall 2024–present
- Long Doan (PhD student) Summer 2024–present

  Co-author of C10
- Hai Duong (PhD student) Fall 2022–present

  Co-author of J1, C3, C4, C9, C6, J3, C18
- Linhan Li (PhD student) Spring 2021–present

  Outstanding Teaching Assistant Award, GMU Fall 2024
  Co-author of C5, C8
- Didier Ishimwe (PhD student, All but dissertation since 2024) Fall 2019–present

  Co-author of C2, C17, J6, W1
- Muhammad Azan Rasul (undergrad, NSF REU) Fall 2025–present
- Phu Le (undergrad, NSF REU) Fall 2025–present
- Stefania Piciorea (undergrad) Spring 2024–present

  Outstanding Undergraduate Research Award Spring 2024
  Co-author of C7

3.2.2 Graduated

- KimHao Nguyen (BS, UNL) graduated, May 2023

  First job: Jump Trading
  Outstanding Undergraduate Senior Award Spring 2023
  Outstanding Undergraduate Research Assistant Award Spring 2021
  Winner, College of Arts and Science, Nebraska Student Research Days (for GenTree C19) Spring 2021
  UNL UCARE Award
  Garmin Computer Engineering Scholarship (2020–2023)
  Co-author of J5, J6, C12, C15, C17, C18, C19, C22, C25
- Guolong Zheng (PhD, UNL) graduated, May 2022

  First job: A10Networks, Now: Minjiang University
  PhD Dissertation: *Ensure Correctness for Imperative and Declarative Programs*
  Co-author C13, C14, C20, C21, C23, C24, C26, C27, W2
- Alexey Malyshev (MS, UNL), Fulbright scholarship graduated, Spring 2021

  First job: Oracle
  MS Thesis: *Discovering Program Invariants Using Static and Dynamic Analysis Techniques*
  Co-author of W1
- Mitch Girrard (MS, UNL), co-advised with Matthew Dwyer graduated, Fall 2019

  Continued to UVA and obtained PhD in 2022

MS Thesis: *Cooperation Among Program Analyzers*

- **Undergraduate Research**:
  - GMU: Huong Bui, James (Phap) Nguyen; Phuong Priscilla Nguyen (Undergraduate, Boston University); Michael Vittori
  - UNL: KimHao Nguyen, Max Nguyen (UCARE[1]), Linhan Li (UCARE, continued on PhD program at GMU), Ben Galusha (NSF REU), Ethan Butt (Honor Thesis), Conner Hallett (UCARE), Chase Pearson, Nancy Pham, Zixuan Hao.

3.3 Other Teaching Accomplishments

- Mentor, Google Summer of Code, Project: Java PathFinder [W2] Summer'18

4 Service

4.1 Professional Service

4.1.1 Research Proposal Review

- Review Panelist, NSF 2019–present (*10+ panels,* ***at least once every year*** *since 2019*)
  - '25 (**7x**[2]), '24 (4x), '23 (2x), '22 (2x), '21 (1x), '20 (1x), '19 (1x)
- Review Panelist, PhD Fellowships (NSF GRFP and DoD NDSEG)

  Details omitted for confidentiality

4.1.2 Conference Committee Members (International)

PC: Technical Program Committee

- PC, Programming Language Design and Implementation (PLDI) 2024
- PC, Object-Oriented Programming, Systems, Languages & Applications (OOPSLA) 2024
- PC, Int. Symposium on Software Testing and Analysis (ISSTA) 2023
- PC, Foundation of Software Engineering (FSE) 2018, 2019
- PC, Automated Software Engineering (ASE) 2018, 2019, 2020
- PC, Java PathFinder Workshop (JPF) 2019, 2020
- New Faculty Symposium Panel, Int. Conf. of Software Engineering (ICSE) 2020
- PC, Int. Conf. of Software Engineering Demo Track (ICSE DEMO) 2020
- PC, Int. Conf. of Software Engineering Posters Track (ICSE Posters) 2020
- PC, Genetic Improvement Workshop 2017, 2020
- PC, ASE Journal First 2019

[1]The Undergraduate Creative Activities and Research Experience (UCARE) program is a paid-position for undergraduate students to do research with UNL faculty.

[2]In 2025, NSF faced many uncertainties and organizational changes, which might have made it difficult for program managers to find people willing to serve on panels and further caused delays in reviews. So I made an effort to say "yes" to all invitations to panels aligned with my expertise, to support NSF and the U.S. funding landscape (though the trade-off was saying "no" to most invitations to conference program committees and journal reviews!).

- PC, Systems and Software Product Line-Challenge Track (SPLC) 2018
- External Review Committee, Programming Language Design and Implementation (PLDI) 2018
- Artifact Evaluation Committee, Principles of Programming Languages (POPL) 2017
- PC, Formal Methods and Models for System Design (MEMOCODE) 2016, 2017, 2018

4.1.3 Conference Organization and Journal Editorships

- PC Chair, Competition Papers, Int. Verification of Neural Networks Competition (VNN-COMP'25) 2025
- Proceedings Co-Chair, Int. Conf. of Software Engineering (ICSE) 2022
- Editor Board, Journal of Systems and Software 2017–2021

4.1.4 Conference Committee Member (Regional)

- Co-Organizer, Midwest Big Data Summer School (Iowa State), Software Analytic Track 2018

4.1.5 Journal Reviewing

Reviewer for Transactions on Software Engineering (TSE), Journal of Systems and Software (JSS), Transactions on Software Engineering and Methodology (TOSEM), Journal of Symbolic Computation, Journal of Evolutionary Intelligence, Transactions on Evolutionary Computation

4.2 Departmental and University Services

4.2.1 Departmental Services

- **Program Director**, MS Software Engineering 2023–present
- Member, Web Committee 2022–present
  - Co-Lead CS Web Site Migration Committee 2024–2005
- Co-organizer, Distinguished Lecturer Series 2025–present
- Member, Dept. Chair Renewal Committee 2024
- Member, MS Software Engineering Admission Committee 2023–present
- Member, Executive Committee 2022–2023
- Member, PhD Admission Committee 2021–present

  Co-organize Virtual Open House (VOH) events 2021–2023
  Create VOH'23 website (`https://cs-gmu.github.io/cs-phd-voh-s23/`)
- Member, Graduate CS Program Committee 2020–2021
- Member, Faculty Search Committee 2019–2020
- Member, Awards Committee 2018–2019
- Member, Software Engineering Search Committee 2018–2019
- Member, Graduate Recruitment 2018
- Member, Graduate Admission 2016–2020
- Member, Qualifying Exam Committee-Theory Track 2016–2018

4.2.2 University Programs and Services

- Member, **Faculty Senate**, representing the College of Engineering and Computing (CEC) 2024–present
- Scholarship Judge, GMU CEC Representative for the Kimmy Long Scholarship Foundation 2024
- Mentor, ORIEI NSF CAREER Cohort 2024–current
- Panelist, GMU New Faculty Panel 2022
- Reviewer, UNL Graduate Travel Award Program Committee 2017
- Fellow, UNL Research Development Fellows Program 2016–2017

4.3 Other Services

- Interviewer, Vietnamese Education Foundation 2.0 (VEF2.0) Fellowship Program 2023–2024

  Evaluate applications and interview VEF2.0 fellows for CS PhD applications in the US
- Judge, Thomas Jefferson Highschool (Fairfax, VA) Science and Engineering Fair 2023

5 Professional Affiliations

- **Senior Member**, Association for Computing Machinery (ACM) 2025
- **Senior Member**, Institute of Electrical and Electronics Engineers (IEEE) 2025

6 Miscellaneous

- Citizenship: **U.S** (DoD Secret Clearance—inactive)
- Extracurricular: **Chess** coach for Marshall Elementary School (2025–present)

  Led club to multiple top-3 team finishes and individual medal placements at regional tournaments.
- My Erdős number is ≤ 4

  ThanhVu (Vu) Huy Nguyen ↔ Thang Bui (MS Adviser) ↔ Tom Leighton ↔ Fan Chung ↔ Pál Erdős
- My Math/CS Genealogy:

  ThanhVu (Vu) Huy Nguyen ↔ Deepak Kapur (PhD Advisor) ↔ Barbara Liskov (Turing Award 2008) ↔ John McCarthy (Turing Award 1971) ↔ Solomon Lefschetz ↔ William Story ↔ ...

  ThanhVu (Vu) Huy Nguyen ↔ Stephanie Forrest (PhD Advisor) ↔ John Holland ↔ Arthur Burks ↔ Cooper Langford ↔ Edwin Boring ↔ Edward Titchener ↔ ...