Curriculum Vitae

Harley Eades III, Ph.D.
Associate Professor
School of Computer and Cyber Sciences
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EDUCATION:

- **Doctor of Philosophy in Computer Science**, August 2014, *University of Iowa, IA*.

  Dissertation Title: The Semantic Analysis of Advanced Programming Languages

- **Masters of Science in Computer Science**, May 2013, *University of Iowa, IA*.

- **Bachelor of Science in Applied Mathematics and Computer Science**, May 2009, *Millikin University*

WORK EXPERIENCE:

- 2020, August – Present: Associate Professor

  Augusta University School of Computer and Cyber Sciences

    - Research, teaching, service

- 2014, August – 2020, May: Assistant Professor

  Augusta University School of Computer and Cyber Sciences

    - Research, teaching, service

AWARDS/RECOGNITION:

- Recognized for Scholarship at the Annual Celebration of Faculty, Augusta University, 2018.
- The Graduate College Summer Fellowship, University of Iowa, 2013.
- The Strategic Initiative Funds Fellowship, University of Iowa, 2011.
- Mathematics and Computer Science Award, Millikin University, 2009.
- Mathematics and Computer Science Award, Millikin University, 2008.
- Mathematics and Computer Science Award, Millikin University, 2007

PROFESSIONAL ORGANIZATION MEMBERSHIPS:

- ACM Special Interest Group on Logic and Computation (2014–Present)
- ACM Special Interest Group on Programming Languages (2014–Present)
- Eurpoean Association of Theoretical Computer Science (2011–Present)

NATIONAL AND INTERNATIONAL SERVICE:

- Cochair (2022), International Workshop on Type-Driven Development (TyDe).

- Reviewer (2022), Types Workshop.

- Reviewer (2022), 7th International Conference on Formal Structures for Computation and Deduction (FSCD).

- Programming Computation Memberships (2022), Ninth Workshop on Mathematically Structured Functional Programming (MSFP)

- Reviewer (2021), ACM Transactions on Computational Logic (TOCL).

- Reviewer (2021), Journal of Functional Programming (JFP).

- Programming Committee Member (2021), The International Conference on Functional Programming (ICFP).

- Reviewer (2021), 29th EACSL Annual Conference on Computer Science Logic (CSL).

- Reviewer (2020), Journal of Applied Categorical Structures.

- Programming Committee Member (2020), Joint Workshop Linearity & TLLA.

- Cochair (2020), The International Workshop on Graphical Models for Security (GraMSec).

- Reviewer (2020), The 47th International Colloquium on Automata, Languages and Programming (ICALP).

- Reviewer (2020), Logic in Computer Science (LICS).

- Reviewer (2020), Journal of Logical and Algebraic Methods in Programming (JLAMP).

- Reviewer (2019), Logical Methods in Computer Science (Journal).

- Chair (2019–2020), First Annual Southeast Regional Programming Languages Seminar (SERPL).

- Programming Committee Member (2017–2019), The International Workshop on Graphical Models for Security (GraMSec).

- Programming Committee Member (2013), The Seventh ACM SIGPLAN Workshop on Programming Languages meets Program Verification (PLPV).

- Reviewer (2019), NSF Hardware and Software Foundations SMALL competition.

- Reviewer (2019), NSF Formal Methods in the Field (FMitF) competition.

- Reviewer (2018), 11th Conference on Intelligent Computer Mathematics (CICM 2018).

- Reviewer (2018), Advances in Modal Logic (AiML).

- Reviewer (2018), Seventh Workshop on Mathematically Structured Functional Programming (MSFP).

- Reviewer (2018), Logical Methods in Computer Science (Journal).

- Reviewer (2016), Sixteenth International Workshop on Logic and Computational Complexity (LCC).

- Reviewer (2016), Advances in Modal Logic (AiML).

- Reviewer (2016), The Thirty-First Annual ACM/IEEE Symposium on Logic in Computer Science (LICS).

- Reviewer (2015), Workshop on Logic, Language, Information and Computation (Wollic).

- Reviewer (2015), Logica Universalis (Journal).

- Reviewer (2015), The 13th International Conference on Typed Lambda Calculi and Applications (TLCA).

- Reviewer (2015), Logical Methods in Computer Science (Journal).

- Reviewer (2014), The 7th International Joint Conference on Automated Reasoning (IJCAR).

- Reviewer (2014), Joint Meeting of the Twenty-Third EACSL Annual Conference on Computer Science Logic (CSL) and the Twenty-Ninth Annual ACM/IEEE Symposium on Logic in Computer Science (LICS).

- Reviewer (2013), Logical Methods in Computer Science (Journal).

- Reviewer (2013), The 11th International Conference on Typed Lambda Calculi and Applications (TLCA).

- Reviewer (2013), The 19th International Conference on Tools and Algorithms for the Construction and Analysis of Systems (TACAS).

- Reviewer (2013), The 23rd International Conference on Rewriting Techniques and Applications (RTA).

- Reviewer (2012), The 6th International Joint Conference on Automated Reasoning (IJCAR).

UNIVERSITY/COLLEGE SERVICE:

- SCCS Promotion and Tenure Committee (Fall 2020 – Present)

- Member of the Graduate School of Augusta University (Spring 2019 – Present)

- SCCS Faculty Affairs Committee, Augusta University (2017–Present)

- Faculty Chair of the School of Computer and Cyber Sciences Colloquium Series (Spring 2020 – Spring 2021)

- Faculty Chair of the School of Computer and Cyber Sciences Chapter of Upsilon Pi Epsilon (UPE), the International Honor Society for the Computing and Information Disciplines (Spring 2019 – Spring 2021)

- CURS Faculty Advisory Committee (2017–2022)

- IT Advisory Committee: Research Advisory Subcommittee (2016–2021)

- SCCS Masters in Computer Science Proposal Committee (Spring 2019)

- SCCS Faculty Search (Spring 2019)

- SCCS Faculty Affairs Committee (2018)

- S-STEM Workgroup (2017–2018)

- CS Education Endorsement Workgroup (2017–2018)

- Curriculum and Academic Policies Augusta University, (2016–2018)

- HULL Faculty Affairs Committee (2016–2017)

- HULL ABET Assessment Committee (2015–2017)

- HULL Computer Science Curriculum Committee (2015)

- HULL Undergraduate Curriculum Committee, Augusta University (Fall 2015)

- Internal Advisory Committee for the Cyber Institute (2014–2016)

TEACHING EXPERIENCE:

- Principles of Computer Programming I (Undergraduate)
- Mathematical Structures in Computer Science (Undergraduate)
- Theory of Computation (Undergraduate)
- Programming Languages Concepts (Undergraduate)
- Programming Languages (Graduate)
- Introduction to Category Theory in Computer Science (Graduate)
- Computer Science Colloquium Series (Graduate)

REFEREED JOURNAL PUBLICATIONS

- **Quantitative Program Reasoning with Graded Modal Types.** Dominic Orchard, Vilem-Benjamin Liepelt, Harley Eades III. Proceedings of the ACM on Programming Languages (PACMPL), 18 August 2019. Volume 3, Issue ICFP. 30 pages in length. Acceptance Rate: 30%. DOI: 10.1145/3341714

- **Constructive Temporal Logic, Categorically.** Valeria de Paiva and Harley Eades III. IFCoLog Journal of Logic and its Applications. 01 February 2017. Volume 4, Number 4, Special Issue Dedicated to the Memory of Grigori Mints. 21 pages in length.

- **Dualized Simple Type Theory.** Harley D. Eades III, Aaron Stump, Ryan McCleeary. Logical Methods in Computer Science, 15 August 2016. Volume 12, Issue 3. 47 pages in length. DOI: 10.2168/LMCS-12(3:2)2016

- **Equational Reasoning about Programs with General Recursion and Call-by-value Semantics.** Garrin Kimmell, Aaron Stump, Harley D. Eades III, Peng Fu, Tim Sheard, Stephanie Weirich, Chris Casinghino, Vilhelm Sjoberg, Nathan Collins and Ki Yung Ahn. Special Issue on Advanced Programming Techniques for Construction of Robust, General and Evolutionary Programs. Progress in Informatics, pages 19-46, March 2013, journal version of PLPV'12 paper.

REFEREED CONFERENCE AND WORKSHOP PUBLICATIONS

- **A Dependent Dependency Calculus.** Pritam Choudhury, Harley Eades III, Stephanie Weirich. In the Proceedig of the 31st European Symposium on Programming (ESOP 2022), pp 403-430. DOI: 10.1007/978-3-030-99336-8_15.

- **Graded Modal Dependent Type Theory.** Benjamin Moon, Harley Eades III, Dominic Orchard. In the Proceedings of the 30th European Symposium on Programming (ESOP 2021), pp 462-490. DOI: 10.1007/978-3-030-72019-3_17.

- **A graded dependent type system with a usage-aware semantics**. Pritam Choudhury, Harley Eades III, Richard A. Eisenberg, and Stephanie Weirich. 2021. Proc. ACM Program. Lang. 5, POPL, Article 50 (January 2021), 32 pages. DOI: 10.1145/3434331

- **Extended Abstract: Towards Graded Modal Dependent Types.** Benjamin Moon, Harley Eades III, Dominic Orchard. The workshop on Type-Driven Development colocated with the 25th ACM SIGPLAN International Conference on Functional Programming (ICFP). August 2020. 3 pages in length.

- **Abstract: Grading Adjoint Logic**. Harley Eades III and Dominic Orchard. 2020 Joint Workshop on Linearity & TLLA: The 6th Workshop on Linearity and the 4th Workshop on Trends in Linear Logic and Applications. June 2020. 2 pages in length.

- **Extended Abstract: The Graded Lambek Calculus**. Aubrey Bryant and Harley Eades III. 2020 Joint Workshop on Linearity & TLLA: The 6th Workshop on Linearity and the 4th Workshop on Trends in Linear Logic and Applications. June 2020. 8 pages in length.

- **Unifying graded and parameterized monads.** Dominic Orchard, Philip Wadler, and Harley Eades III. In the Proceedings of the Eighth Workshop on Mathematically Structured Functional Programming, MSFP@ETAPS 2020, Dublin, Ireland, 25th April 2020. EPTCS, volume 317, p. 18-38. doi: 10.4204/EPTCS.317.2

- **On the Lambek Calculus with an Exchange Modality.** Jiang, Jiaming, Harley Eades, and Valeria de Paiva. "On the Lambek Calculus with an Exchange Modality." in the Proceedings of The Joint Workshop on Linearity & TLLA, co-located with Third International Conference on Formal Structures for Computation and Deduction (FCSD) in conjunction with the Federated Logic Conference. Electronic Proceedings in Theoretical Computer Science (EPTC) 292, 2019, pages 43–89.

- **On Linear Logic, Functional Programming, and Attack Trees.** Harley Eades III, Jiaming Jiang, and Aubrey Bryant. In: Cybenko G., Pym D., Fila B. (eds) Graphical Models for Security. GraMSec 2018. Lecture Notes in Computer Science, vol 11086. Springer, Cham. DOI: 10.1007/978-3-030-15465-3_5. 15 pages in length.

- **Extended Abstract: On the Lambek Calculus with an Exchange Modality.** Jiaming Jiang, Harley Eades III, and Valeria de Paiva. The Joint Workshop on Linearity & TLLA, co-located with Third International Conference on Formal Structures for Computation and Deduction (FCSD) in conjunction with the Federated Logic Conference. July 2018. 8 pages in length.

- **Dialectica Categories for the Lambek Calculus.** Valeria de Paiva and Harley Eades III. In In Sergei Artemov and Anil Nerode, editors, Proceedings of the Symposium of Logical Foundations of Computer Science (LFCS), Deerfield Beach, Florida, United States, Jan. 8-11, volume 1073 of Lecture Notes in Computer Science, pages 256-272. Springer International Publishing, 2018. DOI: 10.1007/978-3-319-72056-2_16. Acceptance rate: 56%.

- **Extended Abstract: Explaining Type Errors**. Brent Yorgey, Richard A. Eisenberg, and Harley D. Eades III. Off the Beaten Track (OBT). Associated with The 45th ACM SIGPLAN Symposium on Principles of Programming Languages (POPL). January 2018. 2 pages in length.

- **Introducing a New Project on The Combination of Substructural Logics and Dependent Type Theory.** Harley Eades III. International Workshop on Trends in Linear Logic and Applications (TLLA) affiliated with the Second International Conference on Formal Structures for Computation and Deduction (FSCD). 31 July 2017. 2 pages in length.

- **Abstract: Dialectica categories for the Lambek calculus.** Valeria de Paiva and Harley D. Eades III. Association for Symbolic Logic (ASL) Spring Meeting jointly held with the Annual Meeting of the Pacific Division of the American Philosophical Association. April 2017. 2 pages in length.

- **Abstract: On Linear Modalities for Exchange, Weakening, and Contraction.** Harley D. Eades III and Jiaming Jiang. Workshop on Linear Logic, Mathematics, and Computer Science. Associated with Linear Logic: Interaction, Proofs, and Computation (LL2016). November 2016. 2 pages in length.

- **Multiple Conclusion Linear Logic: Cut Elimination and More.** Harley D. Eades III and Valeria de Paiva. In Sergei Artemov and Anil Nerode, editors, Proceedings of the Symposium of Logical Foundations of Computer Science (LFCS), Deerfield Beach, Florida, United States, Jan. 4-7, volume 9537 of Lecture Notes in Computer Science, pages 90-105.

Springer International Publishing, 2016. DOI: 10.1007/978-3-319-27683-0_7. Acceptance rate: 57%.

- **Full Intuitionistic Linear Logic (FILL).** Harley D. Eades III and Valeria de Paiva. Entry in Encyclopedia of Proof Systems. Presented as a Poster at the 25th jubilee edition of the International Conference on Automated Deduction (CADE). `http://proofsystem.github.io/Encyclopedia/`. 2015.

- **Extended Abstract: Reconsidering Intuitionistic Duality.** Aaron Stump, Harley D. Eades III, and Ryan McCleeary. Workshop on Control Operators and their Semantics (COS). Affiliated with Rewriting, Deduction, and Programming (RDP). June 2013. 5 pages in length.

- **Hereditary Substitution for the $\lambda\Delta$-Calculus.** Harley D. Eades III and Aaron Stump. In Ugo de'Liguoro and Alexis Saurin, editors, Proceedings First Workshop on Control Operators and their Semantics, Eindhoven, The Netherlands, June 24-25, 2013 , volume 127 of Electronic Proceedings in Theoretical Computer Science, pages 45-65. Open Publishing Association, 2013.

- **LFSC for SMT Proofs: Work in Progress.** Aaron Stump, Andrew Reynolds, Cesare Tinelli, Austin Laugesen, Harley D. Eades III, Corey Oliver and Ruoyu Zhang. Proof Exchange For Theorem Proving (PxTP). 2012. 7 pages in length.

- **Irrelevance, heterogeneous equality, and call-by-value dependent type systems.** Vilhelm Sjoberg, Chris Casinghino, Ki Yung Ahn, Nathan Collins, Harley D. Eades III, Peng Fu, Garrin Kimmell, Tim Sheard, Aaron Stump, and Stephaine Weirich. In J. Chapman and P. B. Levy, editors, Proceedings Fourth Workshop on Mathematically Structured Functional Programming, Tallinn, Estonia, 25 March 2012, volume 76 of Electronic Proceedings in Theoretical Computer Science, pages 112-162. Open Publishing Association, 2012.

- **Equational Reasoning about Programs with General Recursion and Call-by-value Semantics.** Garrin Kimmell, Aaron Stump, Harley D. Eades III, Peng Fu, Tim Sheard, Stephanie Weirich, Chris Casinghino, Vilhelm Sjoberg, Nathan Collins and Ki Yung Ahn. The Sixth ACM SIGPLANW orkshop Programming Languages meets Program Verification (PLPV), pages 15-26, 2012.

- **Hereditary Substitution for Stratified System F.** Harley D. Eades III and Aaron Stump. International Workshop on Proof-Search in Type Theories (PSTT), 2010. Affiliated with the Federated Logic Conference (FLoC). 7 pages in length.

INVITED SPEAKER PRESENTATIONS

- **Graded Modal Types.** Harley Eades III. Principles of Programming Seminar. Principles of Programming (PoP) Group. Carnegie Mellon University (CMU). February 2020.

- **The Three Perspectives of Computation.** Harley D. Eades III. Department of Mathematical Sciences Colloquium Speaker. October 2016. Length: 55min.

- **A New Foundation of Attack Trees in Monoidal Categories.** Harley D. Eades III. Computer Science Department Colloquium Speaker. The University of Iowa. September 2016. Length: 60min.

OTHER RESEARCH CONTRIBUTIONS

- **Lambek Calculus.** Harley D. Eades III and Valeria de Paiva. Entry in Encyclopedia of Proof Systems. `http://proofsystem.github.io/Encyclopedia/`. 2016.

- **Two-sided Linear Sequent Calculus.** Elaine Pimentel and Harley D. Eades III. Entry in Encyclopedia of Proof Systems. `http://proofsystem.github.io/Encyclopedia/`. 2015.

- **Constructive Modal Logic S4 (CS4).** Harley D. Eades III and Valeria de Paiva. Entry in Encyclopedia of Proof Systems. `http://proofsystem.github.io/Encyclopedia/`. 2015.

- **Full Intuitionistic Logic.** Harley D. Eades III and Valeria de Paiva. Entry in Encyclopedia of Proof Systems. `http://proofsystem.github.io/Encyclopedia/`. 2015.

GRANTS/FUNDING

Percent Funded: 33% (3 funded / 9 submited)
Total Funded: $510,897

Title	SHF:SMALL: Semantically and Practically Generalizing Graded Modal Types
Funding Organization	National Science Foundation (NSF)
$ Amount Requested	$426,413
Type	External
PI(s)	Harley Eades III
Beginning/Ending Dates	April 2021 - May 2024
Status (Unfunded, Funded, Pending)	Funded

Title	CAREER: Data as a Resource: Type-Based Tracking of Data Usage Through Programs
Funding Organization	National Science Foundation (NSF)
$ Amount Requested	$543,969
Type	External
PI(s)	Harley Eades III
Beginning/Ending Dates	March 2020 - February 2025
Status (Unfunded, Funded, Pending)	Unfunded

Title	CAREER: Developing the Theory of Resource-Sensitive Type Systems
Funding Organization	National Science Foundation (NSF)
$ Amount Requested	$550,000
Type	External
PI(s)	Harley Eades III
Status (Unfunded, Funded, Pending)	Unfunded

Title	NSF Student Travel Grant for 2019 Southeast Regional Programming Languages Seminar (SERPL)
Funding Organization	National Science Foundation (NSF)
$ Amount Requested	$5,000
Type	External
PI(s)	Harley Eades III and Clément Aubert
Beginning/Ending Dates	March 2019 - February 2020
Status (Unfunded, Funded, Pending)	Funded

Title	CAREER: Developing the Theory of Resource-Sensitive Dependent Type Systems
Funding Organization	National Science Foundation (NSF)
$ Amount Requested	$642,591
Type	External
PI(s)	Harley Eades III
Status (Unfunded, Funded, Pending)	Unfunded

Title	IIAP: Verifying Information Flow Secure Programs using Graded Dependent Types
Funding Organization	Augusta University's Cyber Institute
$ Amount Requested	$9,263
Type	Internal
PI(s)	Harley Eades III
Beginning/Ending Dates	November 2017 - July 2018
Status (Unfunded, Funded, Pending)	Funded

Title	CAREER: Tenli: A Platform that Takes the Verification of Resource Dependent Systems Seriously
Funding Organization	National Science Foundation (NSF)
$ Amount Requested	$500,272
Type	External
PI(s)	Harley Eades III
Status (Unfunded, Funded, Pending)	Unfunded

Title	Disco: A Programming Environment for Discrete Mathematics Education
Funding Organization	National Science Foundation (NSF)
$ Amount Requested	$299,254
Type	External (Collaborative)
PI(s)	Harley Eades III and Brent Yorgey
Status (Unfunded, Funded, Pending)	Unfunded

Title	CRII:SHF: A New Foundation for Attack Trees Based on Monoidal Categories
Funding Organization	National Science Foundation (NSF)
$ Amount Requested	$70,221
Type	External
PI(s)	Harley Eades III
Beginning/Ending Dates	March 2016 - February 2019
Status (Unfunded, Funded, Pending)	Funded