

Alex Kavvos

Merchant Venturers Building
Woodland Road
Bristol
BS2 1UB
United Kingdom

alex.kavvos@bristol.ac.uk
<https://seis.bristol.ac.uk/~tz20861>
ORCID: 0000-0001-7953-7975 

Research interests Logical and algebraic approaches to Computer Science: theory and semantics of programming languages; (homotopy) type theory; category theory and its applications; formal models of security.

Appointments

- | | |
|-------------------|---|
| Jul 2022– | Senior Lecturer in Programming Languages
Department of Computer Science, University of Bristol |
| Jul 2020–Jul 2022 | Lecturer in Programming Languages
Department of Computer Science, University of Bristol |
| Aug 2019–Jun 2020 | Postdoc
Department of Computer Science, Aarhus University
Supervisor: Professor Lars Birkedal |
| Jan 2019–May 2019 | Visiting Assistant Professor
Department of Mathematics and Computer Science, Wesleyan University |
| May 2018–Jul 2019 | Postdoctoral Research Associate
Department of Mathematics and Computer Science, Wesleyan University
Supervisor: Professor Daniel R. Licata |
| Oct 2014–Sep 2017 | Non-Stipendiary College Lecturer and Admissions Interviewer
University College, Oxford |

Education

- | | |
|-------------------|---|
| Oct 2013–Nov 2017 | DPhil in Computer Science
St John's College, University of Oxford
Supervisor: Professor Samson Abramsky
EPSRC Doctoral Training Grant
Thesis: “On the Semantics of Intensionality and Intensional Recursion.” |
| Oct 2009–Jun 2013 | MCompSci in Computer Science
University College, University of Oxford
First class
Awarded the <i>Hoare Prize</i> (twice) for best overall performance. |

Writings and Presentations

Publications

13. G. A. Kavvos and Daniel Gratzer. 2023. “Under Lock and Key: A Proof System for a Multimodal Logic.” *The Bulletin of Symbolic Logic*, 29, 2, 264–293. doi: [10.1017/bsl.2023.14](https://doi.org/10.1017/bsl.2023.14).
12. Kristina Sojakova and G. A. Kavvos. 2022. “Syllepsis in Homotopy Type Theory.” In: *Proceedings of the 37th Annual ACM/IEEE Symposium on Logic in Computer Science*. Association for Computing Machinery, New York, NY, USA. doi: [10.1145/3531130.3533347](https://doi.org/10.1145/3531130.3533347).
11. Jacob Prinz, G. A. Kavvos, and Leonidas Lampropoulos. 2022. “Deeper Shallow Embeddings.” In: *13th International Conference on Interactive Theorem Proving (ITP 2022)* (Leibniz International Proceedings in Informatics (LIPIcs)). Ed. by June Andronick and Leonardo de Moura. Vol. 237. Schloss Dagstuhl – Leibniz-Zentrum für Informatik, 28:1–28:18. doi: [10.4230/LIPIcs.ITP.2022.28](https://doi.org/10.4230/LIPIcs.ITP.2022.28).
10. Daniel Gratzer, Evan Cavallo, G. A. Kavvos, Adrien Guatto, and Lars Birkedal. 2022. “Modalities and Parametric Adjoints.” *ACM Transactions on Computational Logic*, 23, 3. doi: [10.1145/3514241](https://doi.org/10.1145/3514241).
9. G. A. Kavvos. 2021. “Intensionality, Intensional Recursion, and the Gödel-Löb Axiom.” *Journal of Applied Logics - The IfCoLog Journal of Logics and their Applications*, 8, 2287–2311, 8. arXiv: [1703.01288](https://arxiv.org/abs/1703.01288). Originally presented at IMLA 2017.
8. Zesen Qian, G. A. Kavvos, and Lars Birkedal. 2021. “Client-Server Sessions in Linear Logic.” *Proceedings of the ACM on Programming Languages*, 5, ICFP. doi: [10.1145/3473567](https://doi.org/10.1145/3473567). **Distinguished paper award.**
7. Daniel Gratzer, G. A. Kavvos, Andreas Nuyts, and Lars Birkedal. 2021. “Multimodal Dependent Type Theory.” *Logical Methods in Computer Science*, 17, 3. doi: [10.46298/lmcs-17\(3:11\)2021](https://doi.org/10.46298/lmcs-17(3:11)2021). Full version of LICS 2020 article.
6. G. A. Kavvos. 2020. “Dual-Context Calculi for Modal Logic.” *Logical Methods in Computer Science*, 16, 3. doi: [10.23638/LMCS-16\(3:10\)2020](https://doi.org/10.23638/LMCS-16(3:10)2020). Full version of LICS 2017 article.
5. Daniel Gratzer, G. A. Kavvos, Andreas Nuyts, and Lars Birkedal. 2020a. “Multimodal Dependent Type Theory.” In: *Proceedings of the 35th Annual ACM/IEEE Symposium on Logic in Computer Science*. Association for Computing Machinery, New York, NY, USA, 492–506. doi: [10.1145/3373718.3394736](https://doi.org/10.1145/3373718.3394736).
4. G. A. Kavvos, Edward Morehouse, Daniel R. Licata, and Norman Danner. 2019. “Recurrence Extraction for Functional Programs through Call-by-Push-Value.” *Proceedings of the ACM on Programming Languages*, 4, POPL. arXiv: [1911.04588](https://arxiv.org/abs/1911.04588). doi: [10.1145/3371083](https://doi.org/10.1145/3371083).
3. G. A. Kavvos. 2019a. “Modalities, Cohesion, and Information Flow.” *Proceedings of the ACM on Programming Languages*, 3, POPL. doi: [10.1145/3290333](https://doi.org/10.1145/3290333).
2. G. A. Kavvos. 2017a. “Dual-context calculi for modal logic.” In: *2017 32nd Annual ACM/IEEE Symposium on Logic in Computer Science (LICS)*. IEEE. doi: [10.1109/LICS.2017.8005089](https://doi.org/10.1109/LICS.2017.8005089).
1. G. A. Kavvos. 2017b. “On the Semantics of Intensionality.” In: *Foundations of Software Science and Computation Structures* (Lecture Notes in Computer Science). Ed. by Javier Esparza and Andrzej S. Murawski. Vol. 10203. Springer Berlin Heidelberg, 550–566. arXiv: [1602.01365](https://arxiv.org/abs/1602.01365). doi: [10.1007/978-3-662-54458-7_32](https://doi.org/10.1007/978-3-662-54458-7_32).

Invited Talks and Seminars

- Two-dimensional Kripke Semantics. Invited talk at the British Colloquium for Theoretical Computer Science (5 Apr 2024)
- Two-dimensional Kripke Semantics. Invited talk at OASIS (Oxford Advanced Seminar on Informatic Structures) (1 Mar 2024)

- Two-dimensional Kripke Semantics. Invited talk at the University of Birmingham Theoretical Computer Science seminar (23 Feb 2024)
- Functional Logic Programming and Algebraic Effects. Invited talk at the Logsem Seminar, Department of Computer Science, Aarhus University (26 Oct 2023)
- Linear Logic and the Semantics of Concurrent Computation. Talk at the Athens Programming Languages Seminar (28 Dec 2022)
- Linear Logic and the Semantics of Concurrent Computation. Invited seminar at the Department of Computer Science and Technology, University of Cambridge. (18 Nov 2022)
- Type Theory and Homotopy. Invited tutorial at the 13th Panhellenic Logic Symposium (6 Jul 2022)
- Concurrent Classical Effects. Invited talk at the New Ideas in Effects, Types, and Sharing workshop at the University of Bath (14 Jun 2022)
- Client-Server Sessions in Linear Logic. Invited seminar at LIX, École Polytechnique (23 Jun 2021)
- Modalities, Cohesion, and Information Flow. Invited seminar at the Programming, Logic and Semantics group, IT University of Copenhagen (16 Apr 2021)
- Client-Server Sessions in Linear Logic. Invited talk at the Mathematical Foundations Seminar, University of Bath (8 Dec 2021)
- How to define things by recursion. Logsem seminar, Department of Computer Science, Aarhus University (11 May 2020)
- Recurrence Extraction for Functional Programs. Talk at the Athens Programming Languages Seminar (27 Dec 2019)
- Modalities, Cohesion, and Information Flow. Invited seminar at RIMS, Kyoto (17 Oct 2019)
- Curry-Howard for Modal Logic. Invited seminar at the Computation and Reasoning Laboratory, National Technical University of Athens (9 Jan 2019)
- Modalities, Cohesion, and Information Flow. Invited talk at the MIT Categories Seminar (3 Dec 2018)
- Modalities, Cohesion, and Information Flow. Invited seminar at the Department of Computer Science, Tulane University (30 Nov 2018)
- Curry-Howard for Modal Logic. Invited seminar at the Graduate Center, City University of New York (30 Oct 2018)
- On the Semantics of Intensionality. Invited seminar at the Computation and Reasoning Laboratory, National Technical University of Athens (16 Oct 2017)
- On the Semantics of Intensional Recursion. Invited seminar at the Foundations of Software Systems group, University of Sussex (15 Feb 2017)

Conference abstracts

5. Daniel Gratzer, G. A. Kavvos, Andreas Nuyts, and Lars Birkedal. 2020b. “Multimodal Dependent Type Theory.” In: *EUTYPES-TYPES 2020 - Abstracts*. Ed. by Ugo de'Liguoro and Stefano Berardi. <https://types2020.di.unito.it/abstracts/BookOfAbstractsTYPES2020.pdf>.
4. G. A. Kavvos. 2019b. “Proving Noninterference by Abstract Nonsense.” In: *12th Panhellenic Logic Symposium*. Anogeia.
3. Edward Morehouse, G. A. Kavvos, and Daniel R. Licata. 2019. “A Double-Categorical Perspective on Type Universes.” In: *Proceedings of the 25th International Conference on Types for Proofs and Programs (TYPES 2019)*. http://www.ii.uib.no/~bezem/abstracts/TYPES_2019_paper_53.

2. G. A. Kavvos. 2017c. “A Type-Theoretic Alternative to LISP.” in: *23rd International Conference on Types for Proofs and Programs*. Ed. by Ambrus Kaposi. Eötvös Loránd University. <http://types2017.e1te.hu/proc.pdf>.
1. G. A. Kavvos. 2017d. “A Type-Theoretic Alternative to LISP.” in: *Proceedings of the 11th Panhellenic Logic Symposium*. Ed. by Alexandra Soskova, Antonis Kakas, and Nikolaos Papaspyrou. Delphi.

Thesis

Georgios Alexandros Kavvos. 2017. “On the Semantics of Intensionality and Intensional Recursion.” DPhil thesis. University of Oxford. <https://ora.ox.ac.uk/objects/uuid:f89b46d8-b514-42fd-9321-e2803452681f>

Funding

- *Towards Directed Model Categories*. Engineering and Physical Sciences Research Council (EPSRC). £68,873. 2024. As PI.
- *Towards Concurrent Classical Effects*. The Royal Society. £10,536. 2023–2025. As PI.
- *Language Embeddings for Proof Engineering*. Engineering and Physical Sciences Research Council (EPSRC). £97,448. 2023–2025. As PI.
- *Pump Priming Grant*. University of Bristol Faculty of Engineering. £5,000. 2021–2022. As PI.

PhD students

1. April Tune (University of Bristol, 2023–).
2. Daniel Gratzer (Aarhus University, 2019–2023). Co-supervised with Lars Birkedal. Thesis title: **Syntax and semantics of modal type theory**. Now Postdoc at Aarhus University.
3. Zesen Qian (Aarhus University, 2019–2022). Co-supervised with Lars Birkedal. Thesis title: **Concurrency And Races In Classical Linear Logic**. Now Software Engineer at Jane Street Capital.

Other Professional Activities

• Programme committees

Member	LSFA 2024, WADT 2024, TFP 2024, LICS 2023, SBLP 2022, POPL 2021, SBLP 2021, PLS 13, SYCO 7
Chair	PLS 14
Organiser	S-REPLS 13 / Fun in the Afternoon, Strachey 100

• External reviewing

Conferences	FoSSaCS 2024, CSL 2024, MFPS 2023, FoSSaCS 2023, AiML 2022, CSL 2022, LICS 2021, MFPS 2019, FSCD 2019, LICS 2019, CSL 2018, POPL 2018, PEPM 2017, LICS 2016
Journals	Mathematical Structures in Computer Science, Journal of Functional Programming, Logical Methods in Computer Science
Special Issues	Selected papers of LICS 2023 (Logical Methods in Computer Science, guest editor)
Books	Cambridge University Press

- External jury member for a PhD thesis at KU Leuven.
- Mentor for **SIGPLAN-M**, the ACM Special Interest on Programming Languages (SIGPLAN) international long-term mentoring program for programming languages researchers.
- Member of the Association for Computing Machinery (ACM), the European Association for Computer Science Logic (EACSL), and the European Association for Theoretical Computer Science (EATCS)

- Participation at events: BCTCS 2024 (Bath), POPL 2024 (London), FLoC 2022 (Haifa), ICFP 2021 (online), LICS 2021 (online), POPL 2020 (online), ICFP 2020 (online), LICS 2020 (online), MFPS 2020 (online), POPL 2020 (New Orleans), Iris workshop (Aarhus, 2019), TYPES 2019 (Oslo), POPL 2019 (Lisbon), Geometry in Modal Homotopy Type Theory Workshop (Pittsburgh, 2019), Category Theory Octoberfest 2018 (New York City), Voevodsky Memorial (Princeton, 2019), FSCD 2017 (Oxford), ESSLLI 2017 (Toulouse), LICS 2017 (Reykjavik), TYPES 2017 (Budapest), ETAPS 2017 (Uppsala), International Summer School on Metaprogramming (Cambridge, 2016), Homotopy Type Theory Workshop (Oxford, 2014), Prakashfest (Oxford, 2014), Midlands Graduate School (Nottingham, 2014), Samson@60 (Oxford, 2013)

Visits

Nov 2022	University of Cambridge, Department of Computer Science and Technology Invited by Professor Jamie Vicary. 3 day visit.
Oct 2019	Kyoto University, Research Institute for Mathematical Sciences (RIMS) Invited by Dr Amar Hadzihanovic. 6 day visit.
Mar 2019	Carnegie Mellon University, Department of Philosophy Visiting the group of Professor Steve Awodey. 10 day visit.
Mar 2018	National Technical University of Athens, CoReLab Invited by Professor Stathis Zachos. 4 month visit.
Aug 2017	Aarhus University, Logic and Semantics group Invited by Professor Lars Birkedal. 3 day visit.

Teaching

University of Bristol (2020-)

- COMS20007 Programming Languages and Computation: 2023/24 (7 CP), 2022/23 (7 CP), 2021/22 (7 CP).
- COMSM0067 Advanced Topics in Programming Languages: 2023/24 (5 CP), 2022/23 (5 CP), 2021/22 (5 CP).
- COMSM0085 Overview of Software Tools: 2021/22 (10 CP), 2020/21 (20 CP).
- COMS10016 Imperative and Functional Programming: 2020/21 (3.5 CP).
- Supervision of undergraduate and MSc projects.

Aarhus University (2020)

- Tutored PhD student Zesen Qian in the categorical semantics of linear logic.

Wesleyan University (2019)

- Tutored a 4th year student on π -calculus.
- Re-designed and lectured “How to Design Programs” (COMP 115), an introductory functional programming course for non-computer-science majors ([Spring Term 2019](#)).

School of Applied Mathematics, National Technical University of Athens (2018)

- Co-supervised the diploma thesis of Manos Plitsis on categorical models of dependent types.

Department of Computer Science, University of Oxford (2013–2017)

- Taught departmental classes (5-15 students). TA for Computer Security (3rd year/MSc course, 2013). Class Tutor and TA for Advanced Security (4th year/MSc course, 2014 & 2015).

Worcester College, Oxford (2016–2017)

- Tutored a visiting student in Principles of Programming Languages, and Lambda Calculus and Types.

University College, Oxford (2013–2017)

- Tutored students reading for degrees in Computer Science and joint schools (groups of 1-3 students).
Subjects: Functional Programming; Linear Algebra; Discrete Mathematics; Imperative Programming; Object-oriented Programming; Design and Analysis of Algorithms; Logic and Proof; Models of Computation; Lambda Calculus and Types; Categories, Proofs and Processes.
- Involvement in pastoral support.
- Interviewed students for admission to the undergraduate degree.