

# Alex Kavvos

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**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 2020–	<b>Department of Computer Science, University of Bristol</b> <b>Lecturer in Programming Languages</b>
Aug 2019–Jun 2020	<b>Department of Computer Science, Aarhus University</b> <b>Postdoc</b> Supervisor: Prof Lars Birkedal
Jan 2019–May 2019	<b>Department of Mathematics and Computer Science, Wesleyan University</b> <b>Visiting Assistant Professor</b>
May 2018–Jul 2019	<b>Department of Mathematics and Computer Science, Wesleyan University</b> <b>Postdoctoral Research Associate</b> Supervisor: Prof Daniel R. Licata
Oct 2014–Sep 2017	<b>University College, Oxford</b> <b>Non-Stipendiary College Lecturer &amp; Admissions Interviewer</b>
Oct 2013–Jun 2017	<b>Department of Computer Science, University of Oxford</b> <b>Graduate Tutor</b>

## Education

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

# Writings and Presentations

## Publications

6. G. A. Kavvos (2020). “Dual-Context Calculi for Modal Logic”. In: *Logical Methods in Computer Science* 16 (3). doi: 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*. New York, NY, USA: Association for Computing Machinery, pp. 492–506. doi: 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”. In: *Proceedings of the ACM on Programming Languages* 4 (POPL). doi: 10.1145/3371083. arXiv: 1911.04588.
3. G. A. Kavvos (2019b). “Modalities, Cohesion, and Information Flow”. In: *Proceedings of the ACM on Programming Languages* 3 (POPL). doi: 10.1145/3290333.
2. G. A. Kavvos (2017c). “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.
1. G. A. Kavvos (2017d). “On the Semantics of Intensionality”. In: *Foundations of Software Science and Computation Structures*. Ed. by Javier Esparza and Andrzej S. Murawski. Vol. 10203. Lecture Notes in Computer Science. Springer Berlin Heidelberg, pp. 550–566. doi: 10.1007/978-3-662-54458-7\_32. arXiv: 1602.01365.

## Pre-prints

1. G. A. Kavvos (2019a). “A Quantum of Direction”. URL: <https://www.lambdabetaeta.eu/papers/meio.pdf>. Submitted to *Mathematical Structures in Computer Science*.
2. G. A. Kavvos (2016). “The Many Worlds of Modal Lambda Calculi: I. Curry-Howard for Necessity, Possibility and Time”. Draft survey paper, under continuous revision.

## Conference abstracts

1. 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. URL: <https://types2020.di.unito.it/abstracts/BookOfAbstractsTYPES2020.pdf>.
2. G. A. Kavvos (2019c). “Proving Noninterference by Abstract Nonsense”. In: *12th Panhellenic Logic Symposium*. Anogia.
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)*. URL: [http://www.ii.uib.no/~bezem/abstracts/TYPES\\_2019\\_paper\\_53](http://www.ii.uib.no/~bezem/abstracts/TYPES_2019_paper_53).
4. G. A. Kavvos (2017a). “A Type-Theoretic Alternative to LISP”. in: *Proceedings of the 11th Panhellenic Logic Symposium*. Ed. by Alexandra Soskova, Antonis Kakas, and Nikolaos Papaspyrou. Delphi.
5. G. A. Kavvos (2017b). “A Type-Theoretic Alternative to LISP”. in: *23rd International Conference on Types for Proofs and Programs*. Ed. by Ambrus Kaposi. Eötvös Loránd University. URL: <http://types2017.elte.hu/proc.pdf>.

## Thesis

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

## Invited Talks and Seminars

- “Modalities, Cohesion, and Information Flow”. Invited talk 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 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 University of Sussex (15 Feb 2017).

## Teaching

### Aarhus University (2020)

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

### Wesleyan University (2019)

- Tutored 4th year student Pi Songkuntham on  $\pi$ -calculus using individualised course material.
- Re-designed and lectured the COMP 115 “How to Design Programs” course in Spring Term 2019. COMP 115 is an introduction to functional programming for students not necessarily specialising (‘majoring’) in Computer Science.

### 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 tutored: 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.

## Visits

Oct 2019	<b>Kyoto University, Research Institute for Mathematical Sciences (RIMS)</b> Invited by Dr Amar Hadzihanovic. 6 day visit.
Mar 2019	<b>Carnegie Mellon University, Department of Philosophy</b> Visiting the group of Prof Steve Awodey. 10 day visit.
Nov 2018	<b>Tulane University, Department of Computer Science</b> Invited by Prof Michael Mislove. 2 day visit.
Oct 2018	<b>City University of New York, The Graduate Center</b> Invited by Prof Sergei Artemov. 1 day visit
Feb–May 2018	<b>National Technical University of Athens, CoReLab</b> Invited by Prof Stathis Zachos.
Aug 2017	<b>Aarhus University, Logic &amp; Semantics group</b> Invited by Prof Lars Birkedal. 3 day visit.

## Other Professional Activities

- Scientific committee member for the 13th Panhellenic Logic Symposium (2021).
- Programme committee member for the Seventh Symposium on Compositional Structures (SYCO 7).
- Reviewer for MFPS 2019, FSCD 2019, LICS 2019, CSL 2018, POPL 2018, PEPM 2017, LICS 2016 (conferences); Mathematical Structures in Computer Science (journal); Cambridge University Press (books).
- Co-organiser of the Strachey 100 centenary conference, celebrating the life and research of programming languages pioneer Christopher Strachey. (<https://www.cs.ox.ac.uk/strachey100>)
- Participation at events: ICFP 2020 (online), LICS 2020 (online), MFPS 2020 (online), POPL 2020 (New Orleans), Iris workshop 2019 (Aarhus), 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, 2018), FSCD 2017 (Oxford), ESSLLI 2017 (Toulouse), LICS 2017 (Reykjavik), TYPES 2017 (Budapest), ETAPS 2017 (Uppsala), International Summer School on Metaprogramming (Robinson College, Cambridge, 2016), Homotopy Type Theory Workshop (Oxford, 2014), Prakashfest (Oxford, 2014), Midlands Graduate School (Nottingham, 2014), Samson@60 (Oxford, 2013).