Troy Kaighin Astarte

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Teacher and researcher interested in formal methods and history of computing.

Education

PhD in Computing Science
Newcastle University, 2015–2019
'Formalising meaning: a history of programming language semantics'.
Supervisor: Cliff Jones; extended advisory panel: Brian Randell, Martin Campbell-Kelly, John Tucker. Commenced September 2015, completed December 2018, awarded June 2019.
Nominated for CPHC/BCS Distinguished Dissertation Prize.

BSc Computer Science with Industrial Placement
Newcastle University, 2011–2015
Award: first class degree with honours (final mark: 80%).

Earlier education at Lancaster & Morecambe College and Lancaster Royal Grammar School.

Employment

Research Associate, Newcastle University, February 2019–
Worked on EPSRC and Leverhulme Trust funded grants, researching history of concurrency. Two years' module leader experience.

Teaching Assistant, Universiteit van Amsterdam, January 2018, 2019, 2020
Worked supervising students through a one-month research and writing project on the Masters level 'History of Digital Cultures' course.

Analyst, Accenture, 2013–2014
Placement during undergraduate degree. Responsibility included project management, financial planning, and identifying potential clients.

Research assistant, Newcastle University, Summer 2013
Project concerned developing effective power consumption monitoring techniques.

Web designer, Advance With Media, Summer 2012
Developing websites for small business clients using cutting-edge web technologies.

Teaching

Stage 3 module leader
Two years experience developing and delivering content and examination for a third year undergraduate module. Understanding Programming Languages was an advanced course on the formal definition of programming languages.

Training
Two stages of Newcastle University's *Introduction to Learning and Teaching in Higher Education* completed, meeting pre-requisites for CASAP.

Demonstrator experience
Three years' experience, including the following modules:

Stage 1 mathematics, web design, professional development

Stage 2 software engineering, formal modelling with VDM, algorithm design and analysis

Stage 3 server-side web technologies, formal modelling of concurrency, computer security, software verification technologies and formal proof, understanding programming languages

MSc using Linux, history of digital cultures

Marking experience
For all the above modules, including as sole marker and as part of a team, as well as some others including team projects. Assignments marked have included programs, mathematical exercises, presentations, and essays.

Research

Publications

Troy K. Astarte. ""Difficult things are difficult to describe": The role of formal semantics in European computer science, 1960–1980". Submitted for publication in a Johns Hopkins University Press volume

Troy K. Astarte. *The history of programming language semantics: an overview.* Technical Report CS-TR-1533. Newcastle University School of Computer Science, June 2020

Troy K. Astarte, ed. *HFM 2019 - History of Formal Methods Workshop. In Formal Methods. FM 2019 International Workshops. Porto, Portugal, October 7–11, 2019, Revised Selected Papers, Part II.* Lecture Notes in Computer Science 12233. Springer, 2020. DOI: https://doi.org/10.1007/978-3-030-54997-8

"HFM2019 Organizers' Message", In: *ibid.*

"What have formal methods ever done for us? An audience discussion", In: *ibid.*

Troy K. Astarte. "Formalising Meaning: a History of Programming Language Semantics". PhD thesis. Newcastle University, June 2019

Cliff B. Jones and Troy K. Astarte. "Challenges for semantic description: comparing responses from the main approaches". In: *Proceedings of the Third School on Engineering Trustworthy Software Systems.* Ed. by Jonathan P. Bowen, Zili Zhang, and Zhiming Liu. Vol. 11174. Lecture Notes in Computer Science. 2018, pp. 176–217

Cliff B. Jones and Troy K. Astarte. *Challenges for semantic description: comparing responses from the main approaches.* Technical Report CS-TR-1516. Newcastle University School of Computer Science, Nov. 2017

Troy K. Astarte and Cliff B. Jones. "Formal Semantics of ALGOL 60: Four Descriptions in their Historical Context". In: *Reflections on Programming Systems - Historical and Philosophical Aspects.* Ed. by Liesbeth De Mol and Giuseppe Primiero. Springer Philosophical Studies Series, 2018, pp. 71–141

Cliff B. Jones and Troy K. Astarte. *An exegesis of four formal descriptions of ALGOL 60.* Technical Report CS-TR-1498. Newcastle University School of Computer Science, Sept. 2016

Book reviews

Troy K. Astarte. "Mage Merlin's Unsolved Magical Mysteries (review)". In: *LMS Newsletter* 493 (Mar. 2021). To appear.

Troy K. Astarte. "The Discrete Charm of the Machine: Why the World Became Digital (review)". In: *British Journal for the History of Mathematics* 35.1 (2020), pp. 89–91. DOI: [10.1080/26375451.2019.1681827](10.1080/26375451.2019.1681827)

Events organised

Black Heroes of Mathematics (October 2020).
Organising committee.
https://ima.org.uk/15025/black-heroes-of-mathematics-conference/

Mathematics in Times of Crisis (July 2020).
Technical director, administrator.
https://www.bshm.ac.uk/events/mathematics-times-crisis-online-conference

History of Formal Methods 2019 (October 2019).
Co-chair of workshop and editor of proceedings. https://sites.google.com/view/hfm2019/

Newcastle Computing: Celebrating 50 Years of Campus-wide Computing (June 2019).
Chief organiser and chair. http://newcastlecomputing50.ncl.ac.uk

Strachey 100: Celebrating the life and work of Christopher Strachey (November 2016)

Co-organiser, publicist, created booklet, organised exhibition. https://www.cs.ox.ac.uk/strachey100/

Conference talks

ADCK2021

Troy K. Astarte and B. T. Denvir. *ALGOL 60 @ 60: its place in formal semantics.* Peter Landin Semantics Seminar. Dec. 2020

Troy K. Astarte. *On the Difficulty of Describing Difficult Things.* History and Philosophy of Computing 5, Bergamo. Oct. 2019

Troy K. Astarte. *Origins and Impacts of Formal Semantics.* European Society for the History of Science Biennial Conference, London. Sept. 2018

Troy K. Astarte. *Towards an Interconnected History of Semantics.* BSHM Research in Progress, Oxford. Feb. 2018

Troy K. Astarte. *Towards an Interconnected History of Semantics.* History and Philosophy of Computing, Brno, Oct. 2017

Troy K. Astarte. *Formalism in the Forest: the 1964 IFIP Formal Language Description Languages Working Conference.* BSHM Research in Progress, Oxford. Feb. 2017

Troy K. Astarte. *Formalism in the Forest: the 1964 IFIP Formal Language Description Languages Working Conference.* PLASMA Seminar, York. Oct. 2016

Troy K. Astarte. *Formal Semantics of ALGOL 60: a comparison of four descriptions.* History and Philosophy of Programming 3. June 2016

Training

Introduction to Oral History Oral History Society, May 2016.
Methods for interviewing, use of equipment, handling copyright, etc.

Post-graduate researcher development program Newcastle University, 2015–2017.
A number of short courses including research skills and effective reading methods, academic writing, funding and financing, and university organisation.

Professional organisation memberships

British Computer Society Professional member.

ACM SIGCSE Member.

British Society for the History of Mathematics Council member.

Society for the History of Technology Member.

Other experience

EDI Committee, Newcastle University School of Computing, 2019–

Chair, Newcastle University History Computing Committee, 2019–
Chair of small group of volunteers that preserves a large collection of artefacts, as well as creating exhibitions. See https://blogs.ncl.ac.uk/cs-history/about-the-sig/.

Webmaster, British Society for the History of Mathematics, 2019–

Member, PROGRAMme research group
This is a 'virtual research group' sponsored by the French ANR which takes a historical and philosophical look at programming. I am co-author on paper 'Notations: the Ultimate Intermediary' (still in draft).

PGRDP board, Newcastle University, 2015–2017
Duties included working with student feedback and helping develop an effective programme of workshops. Also provided insight into university structure.

Student governor, Lancaster and Morecambe College, 2009–2011
Represented student body on the board of governors and assisted in college strategic direction.