Christian Pardillo Laursen

Education

2020-2021 **MPhil Advanced Computer Science**, *University of Cambridge*.

- Research project: Formalization of Hypermaps in Isabelle
- L11 - Algebraic Path Problems
- L18 - Automated Reasoning
- L304 - Multicore Semantics and Programming
- L310 - Mobile Robot Systems
- L41 - Advanced Operating Systems

2017-2020 **BSc Computer Science**, *University of York*, First Class Honours (with Distinction).

- 3rd Year - 88.5%
  IET Award - Best Performance in the Third Year
- 2nd Year - 85%
  Departmental Award for Best Performance in the Second Year
  As part of my coursework, I undertook a large software engineering group project, in which I took the role of leader.
- 1st Year - 78%

Experience

2020 - 2021 **Master's Project**, *University of Cambridge*.

Formalization of Hypermaps in Isabelle/HOL

Project to translate the foundations of the four colour theorem Coq proof to Isabelle/HOL. For this, I will be developing a theory of hypermaps, which are used to reason about planar maps. This involves proving planarity theorems and formalizing the patch and walkup operations.

June–August 2020 **Summer Research Project**, *YorRobots, University of York*.

Deductive Verification of Cyber-Physical Systems with Isabelle/UTP.

Supervisors: Simon Foster and Mark Post

Developed a method for verifying a model of a robotic control algorithm and soundly refining it to a C program using the Isabelle proof assistant. As a case study, I formalized a model of a differential drive robot and verified collision avoidance for a simple, abstract navigation algorithm. During this project I also contributed to the development of Isabelle/UTP.

2019 - 2020 **Undergraduate Dissertation**, *University of York*.

Integrating Theorem Proving with Computational Algebra Systems

Supervisor: Simon Foster

Wrote a plug-in for the Isabelle theorem prover that allows it to obtain symbolic solutions to ordinary differential equations from the Wolfram Engine, which powers Mathematica. I have co-authored a paper based on this project together with another student and our supervisor, which we have submitted to NFM 2021.

christiansfd (at) protonmail (dot) com • *cplaursen*

Skills

Programming	Familiar with most programming paradigms. Experienced in Haskell, SML, Python, C, and a variety of other languages.
Formal methods	I have experience using the Coq and Isabelle/HOL proof assistants, as well as the FDR4 model checker and the Z specification language.
Computing theory	Experienced in the design and analysis of algorithms for a wide variety of applications, such as concurrency, automated proof, and machine learning.
Mathematics	Knowledge of category theory and related areas, obtained by self-study.
Linux	Adept at using the terminal and a wide range of utilities to manage Linux systems and work efficiently.
Languages	Fluent in Spanish, English and Danish. B1 in German.

christiansfd (at) protonmail (dot) com • *cplaursen*