Project Abstract: Formally verifying Dining Philosophers as Feedback Control

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April 26, 2020

We propose to formally verify the proof development as sketched in the paper on ArXiV: Generalised Dining Philosophers as Feedback Control, within the Coq proof assistant. We will implement the proof, as laid out in sections 1, 2, and 3 (till *The One Dining Philosopher Problem*) of the document above.

Failing to complete the proof development, we will lay out *precisely* the point of failure in the verification, and the ensuing issues with either the Coq proof assistant, or the previously mentioned formalization. The target is conservative to hedge for things going awry: even the best-laid-out-proofs have been waylaid on thier first contact with a system as inflexible as Coq — often, one has to massage theorem statements and proof to appease the proof checker, for no real gain or sense.

If the task of formalizing the first three sections (upto, and including *The One Dining Philosopher Problem*) proceeds faster than anticipated, then as a **stretch goal**, we will attempt to formalize as much of section 4 (*N Dining Philosophers with Centralised control*) as possible.