

Poster Abstract

An Aspect Oriented Design and Modelling Framework for Synthetic Biology

Philip Boeing, Darren Nesbeth, Anthony Finkelstein, and Chris P. Barnes

University College London
`philipp.boeing.10@ucl.ac.uk`

Up until this point, work on synthetic biology has largely used a component-based metaphor for system construction. Here we present a design framework that steps away from this paradigm by utilising aspect oriented software engineering concepts. Though our approach does not rest upon this, we think that the notion of *concerns* is a powerful and biologically credible way of thinking about systems synthesis. By casting the design question in terms of concerns, our framework incorporates and builds upon many features of existing tools. This framework is written in Python which facilitates the adoption of standard software engineering tools and the interaction with existing biological modelling systems. The benefits of our approach are numerous and include improved conceptualisation of synthetic biological systems and a design workflow that iteratively adds complexity by adding more aspects to the design. We demonstrate the effectiveness of this framework by creating an oscillator system based around an oscillating system known as the *repressilator*.