



2027 Summer Research Project Template

Help us present your project in a way that connects with the right students. Thoughtful, engaging descriptions tend to attract stronger and more suitable applications. Thank you for putting a project forward - these programs rely on your contribution, and we couldn't do it without you.

Section	Description
Project title	Why did humans evolve to be so cooperative? Exploring theories of human evolution through agent-based modelling
Hours & delivery	One scholar is expected to work between 20–36 hours per week for six weeks. Working days and hours are highly flexible. The project will be offered through a hybrid arrangement, where the scholar can work remotely or on-site at St Lucia campus in whatever proportions they choose.
About the project (150–250 words)	The human capacity for cooperation fundamentally underpins our success as a species; however, explaining how we evolved to be so cooperative remains a conundrum within evolutionary psychology. Specifically, evolution is supposed to be an inherently selfish process where individuals ruthlessly compete with one another for survival, and it isn't clear how 'selfish' evolution could give rise to extremely cooperative organisms like humans. While researchers have proposed numerous mechanisms (e.g., group selection, within-group reciprocity, cultural evolution) which could potentially have allowed our ancestors to overcome evolution's 'selfish' characteristics, these ideas are currently little more than speculation due to our inability to directly observe or measure our evolutionary past. In response to the opacity of evolutionary history, recent literature has resorted to computer simulations to theoretically test whether a proposed evolutionary mechanism could drive the evolution of human cooperation. In particular, agent-based modelling – a technique that involves simulating finite populations of individuals that interact and compete with one another according to very simple rules – has become increasingly popular in the context of human social evolution, and many avenues for future research remain in this relatively new field. This project will involve designing and coding an agent-based model to test a theory of how human cooperation evolved. While we have a particular theory and model in mind that we wish to test, the student is also welcome to pursue their own theory and design their own model if they wish. Creative input from the student is highly encouraged.
What you'll do (100–150 words)	The student will read two famous agent-based models of human evolution and learn the basics of agent-based modelling by replicating these seminal studies. The student will then extend one of these famous models by including a novel selection pressure and analyse the model's results.
What you'll learn (100–150 words)	Students will gain an introduction to evolutionary concepts and how they can be applied to human psychology. Students will also gain hands-on experience with agent-based modelling and coding in MATLAB. Guidance will be provided to help the student obtain coding skills.
Project outcomes (75–125 words)	By the end of this project, the student should aim to have a working agent-based model which tests a specific theory of how human cooperation evolved.
Who should apply? (75–125 words)	This project is suitable for any undergraduate student who is interested in exploring evolutionary psychology and willing to learn coding skills. Given that coding is required for this project, maths proficiency is desirable although by no means essential (the calculations involved in agent-based modelling are quite simple).



Team & supervision (75–125 words)	Supervisor: Professor Thomas Suddendorf Project Coordinator: Lachlan von Pein (PhD Student) Note: Lachlan von Pein will be primarily responsible for organising the project and providing guidance to the student.
Additional opportunities (optional)	Publication opportunities are possible depending on the results produced by the student's agent-based model.
Additional requirements (if applicable)	NA
Contact	Yes, students should contact the project coordinator before applying. Direct enquiries to: l.vonpein@uq.edu.au