

# The SWARM Project Overview



THE UNIVERSITY OF  
MELBOURNE



The SWARM Project at the University of Melbourne is attempting to achieve fundamental advances in analytical reasoning.

With major funding from IARPA (the US Intelligence Advanced Research Projects Activity), our international, multidisciplinary team is studying how to improve general analytical reasoning. As part of this project we are developing a new online platform to support teams to solve challenging reasoning problems.

SWARM is building collaborative R&D programs with major organisations both within and outside the intelligence community and welcomes expressions of interest.

## IARPA's CREATE Program

In 2017 IARPA launched the CREATE program ("Crowdsourcing Evidence, Argumentation, Thinking and Evaluation.") This 4.5 year program aims to find new ways to support superior human reasoning performance by combining two approaches: crowdsourcing, and structured analytical techniques.

CREATE is supporting four University research teams to develop systems addressing this challenge. The four teams are engaged in a kind of friendly competition to produce the most effective system.

Systems developed by the performers will be evaluated by extensive, rigorous, large-scale testing by an independent team.

Eventually one or more of the systems may be deployed to teams of analysts working in the US intelligence community. It will also be available for use in other organisations and for other applications.

## The SWARM Project

The SWARM Project was selected to be one of the four teams in the CREATE competition.

Based at the University of Melbourne, our team consists of around thirty five researchers and technical staff. It includes staff from Monash University, Imperial College London, and other organisations.

SWARM has around \$25M in funding, assuming we are renewed to the end of the 4.5 year program. We are, to our knowledge, Australia's largest single research program aimed at improving human reasoning.

## Our approach

The essence of SWARM's approach is to support effective teamwork. Specifically, our system is designed to help transform online groups into what we call High Performance Reasoning Teams. This is inspired by elite teams in other domains such as professional sports, military special operations and surgery.

One important attribute of high performance teams is that distinctive processes, i.e. ways of working together. SWARM reasoning teams are equipped with two such "modi operandi." These can be thought of as high-level structured analytical techniques.

One is "**contending analyses**." Using this technique, a team explores and develops multiple distinct analyses of any given problem, before using a rating mechanism to select the best for further refinements as their collective response.

The second is the "**multifocal**" approach. A "logical lens" is any kind of method, tool or concept which can be brought to bear on a problem. A classic structured analytical technique such as Key Assumptions Check is one example. A strong analysis will generally involve applying a number of lenses, with the selection depending very much on the kind of problem. This is similar to the way a doctor would draw on a range of concepts and techniques in diagnosing a condition and planning a treatment.

