

## News story: Dstl shares new open-source framework initiative

A new open-source software framework designed by the Defence Science and Technology Laboratory (Dstl) is now available to help improve tracking technology.

Tracking and state estimation is a vital part of Defence research; being better able to track enemy missiles, vehicles or drones is essential for operational effectiveness. However, the algorithms that crunch the data are complex and difficult to compare. This software framework allows the algorithms to be compared, side-by-side, in a “bake-off” against realistic data.

Leading the project across the 5-eyes nations of UK, USA, Australia, NZ and Canada, Dstl has made the project available to anyone wanting to upload and test their tracking algorithms.

The framework, called Stone Soup, is a software architecture which allows code components to be plugged-in in a modular fashion, such as algorithms, sensor models and simulators.

Users can then model a huge number of outcomes, which can be measured on how they improve survivability, safety, or operational effectiveness. This even has non-defence uses: for example tracking systems are a key component in self-driving cars to ensure the car can be aware of and follow all vehicles and people in its vicinity.

Stone Soup will facilitate and encourage other algorithm developers or tracking practitioners to insert their new components, which can then be compared alongside accepted or state-of-the-art algorithms to help the developers and industry / Government laboratories evaluate them against standard data sets. Alternatively industry can insert their own data into the framework and run this against the standard suite of tracking algorithms it contains. One day this could provide better tracking capabilities for a whole range of difficult problems such as following a swarm of fast drones, tracking space-clutter around the International Space Station or understanding the movements of migrant vessels in the Mediterranean.

This is just one example of the multinational collaboration in science and technology which Dstl engages in. The initiative is supported by four other nations’ Defence labs, including Defence Research and Development Canada, which is contributing to its development.

Professor Paul Thomas, a Senior Principal Scientist at Dstl, said:

We are really excited to be making Stone Soup available to other tracking practitioners giving us the potential to be high-impact in multiple communities. It’s a ‘standard’ platform for tracking

algorithm development, and for testing and benchmarking, which will be a huge benefit for the academic and Defence community.

The framework is in its infancy but the long-term aim is to save lives by having data that can accurately track adversaries, giving commanders in the battlefield full situational awareness.

It's an accelerated learning aid for people who are just coming into this area too. Before this, it could have taken months, even years, to learn the detailed mathematics of tracking. This is a fantastic tool with so many benefits; I hope lots of experts can join us in using and contributing to this framework.

The software is free and is available on [Github](#) and some datasets from Dstl are available below. More information can be found [here](#)