

CSC 7426 : Software & Data Engineering

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`.../CSC7426/CollectiveIntelligence.pdf`

Collective Intelligence

Distributed Donors Problem

Session Structure : interactive

We will start with an interactive session discussing what we know (and can find out) about swarm intelligence/collective reasoning.

You may start to prepare a short 10 minute presentation (max 10 slides) on one of these subjects:

- The historical origins of swarm/collective intelligence
- The state-of-the-art of swarm/collective intelligence
- A must-read publication in the area of swarm/collective intelligence

Additional reading material

- *Distributed optimization by ant colonies*, Colorni, Alberto and Dorigo, Marco and Maniezzo, Vittorio, 1991
- *Universality in elementary cellular automata*, Cook, Matthew, 2004

Distributed Donors Problem

A group of donors wish to donate money to a charitable organisation. In the group there is a single treasurer who is responsible for collecting and counting all the donations.

The following distributed process is used to collect and count donations -

When a donor meets the treasurer, they give their donation to the treasurer and the treasurer updates the donation count. If a donor meets another donor, then the 2 donors combine their donations into a single donation and 1 of the donors takes responsibility for getting the combined donation to the treasurer; the other donor has no longer any role to play in the process. The process is finished when all donors have given their donation to someone else.

We wish to implement a simulation of this process and check that on completion the treasurer has the sum of all the individual donations

We also wish to check the complexity/performance of the distributed algorithm.