TEAM

Bid Fest ‘22

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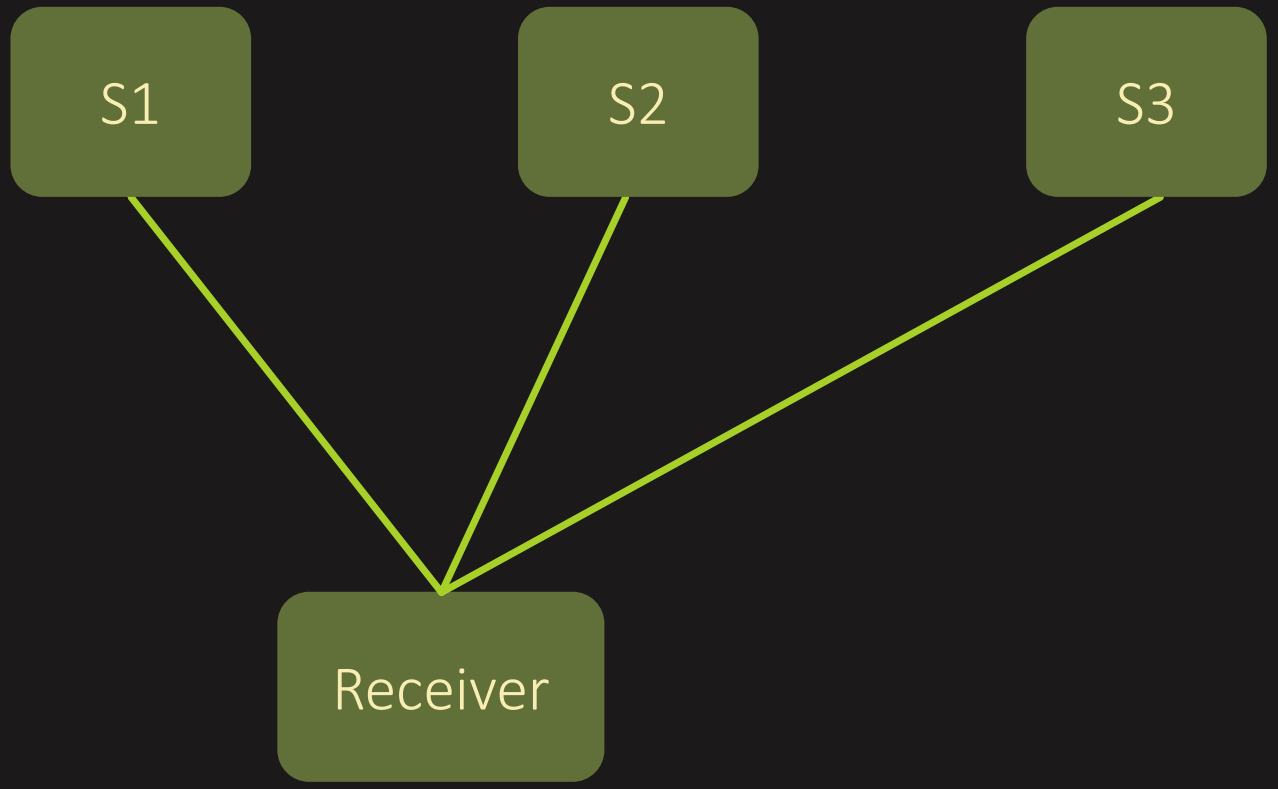
VA – A virtual ant concept

How GPS works ?



The Problem

Unavailability of Satellites

Lesser the satellites, lesser the accuracy

Obstacles

SO,

How does NATURE solve it ?

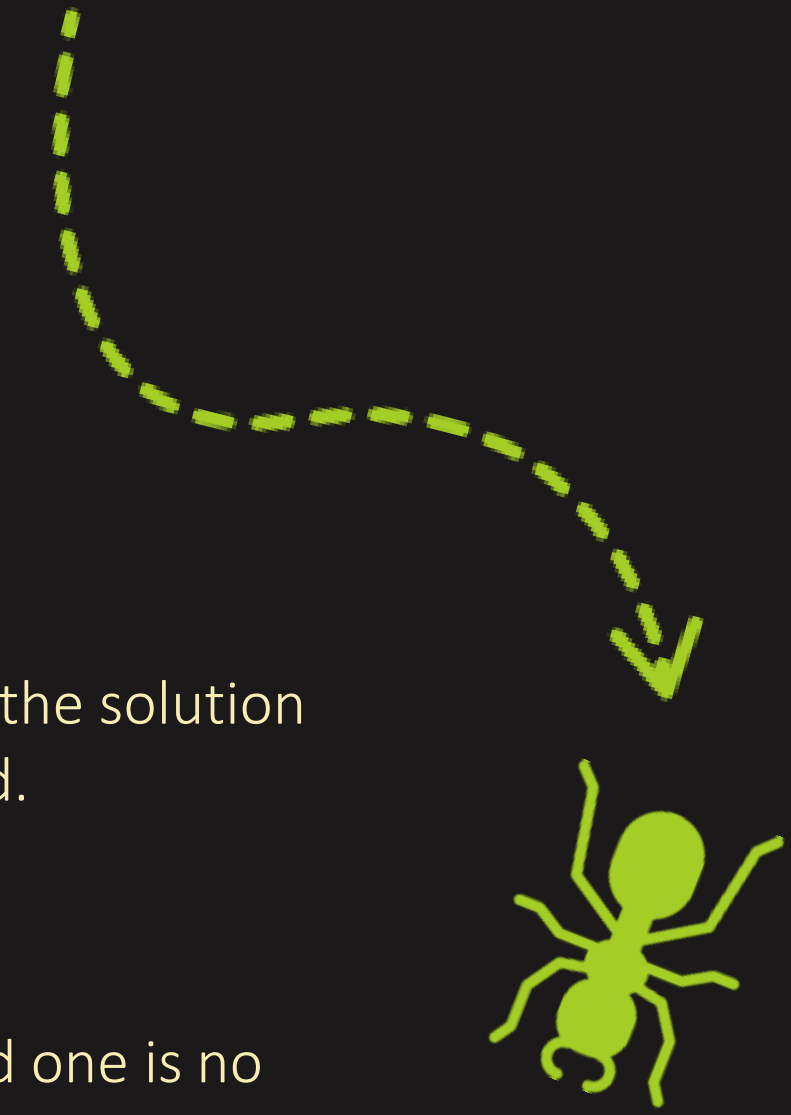
ACO

Ant Colony Optimization

ACO

- Ants that take the shorter route leave a stronger pheromone trail than those who take the longer route.
- Stronger the pheromone, the better it attracts the ants
- The shortest route is increasingly chosen until all the ants choose the shortest route.

ACO



- Each ant individually searches the solution space for the solution and gives some information about the solution found.
- Capable of adapting to changes in the environment
- For example finding a new shortest path once the old one is no longer feasible due to a new obstacle.

SO,

How do we IMITATE the ANTs ?

Graph Network

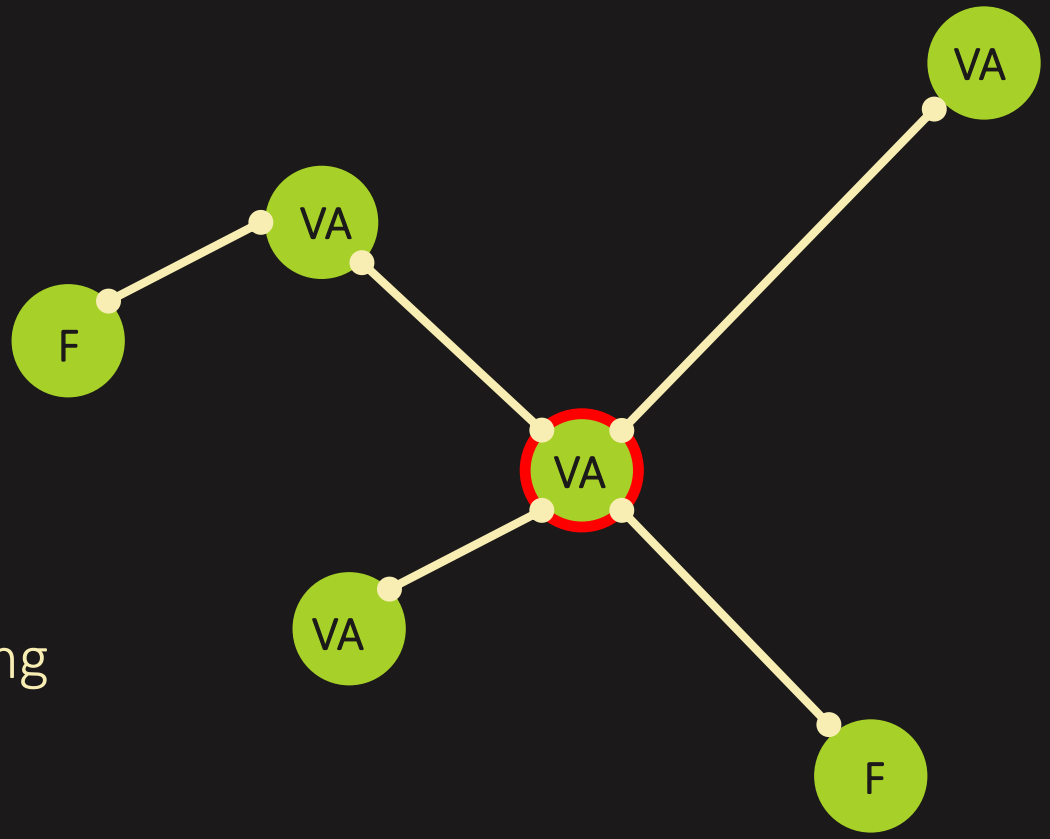
Team Sigma’s Biomimicry proposal

Graph Network

- A collection of arbitrary abstract users called “nodes" and “signals" that represent points of connection
- Considering a varying number of Satellite monitoring for different users.
  - Having inaccurate locations - Virtual Ants(VA).
  - Having accurate locations - Active Nodes or the food for the VA’s

The Digital Pheromones

- Herein, all the users will be assigned a unique Id with a table consisting of User's ID and User's Pheromone Count.
  - What do we mean by Pheromone Count?
  - Total number of times that user has helped in determining a virtual ants location.

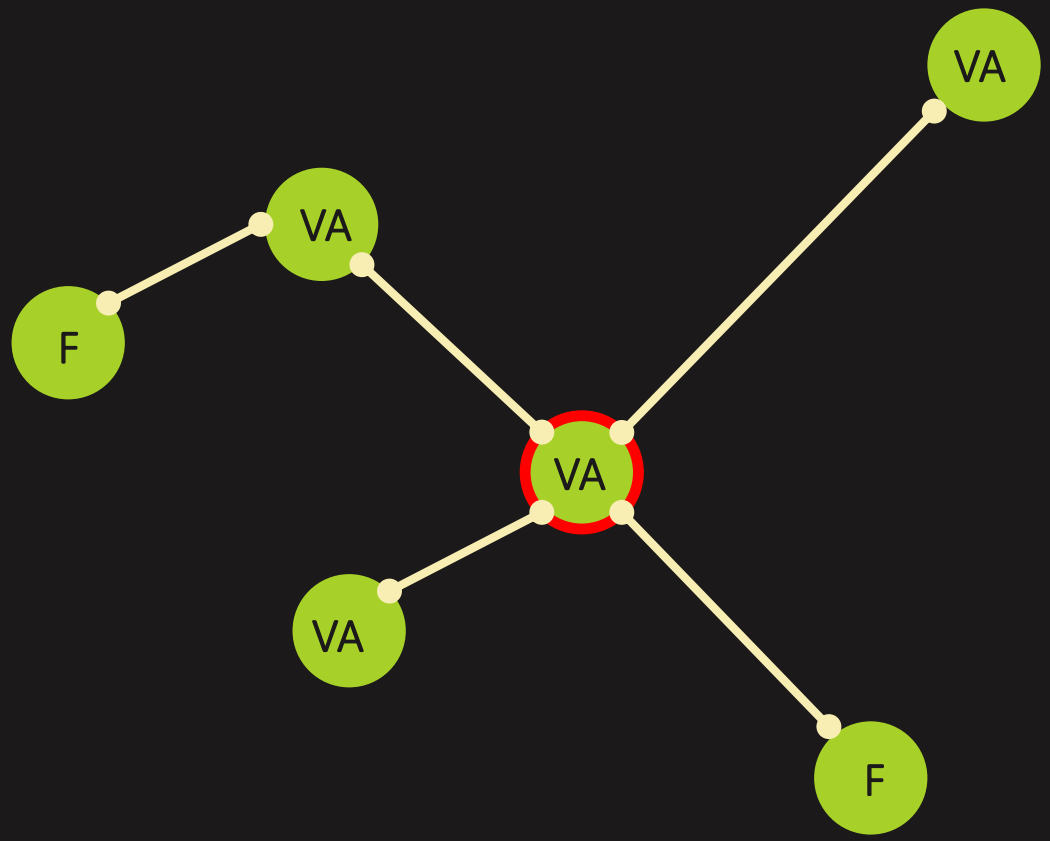


ID	PH

ID	PH

The Digital Pheromones

- In order to improve the location accuracy for a VA user, the VA tends to connect with the accurate nodes or the Food(in terms of ACO) via WIFI Aware



ID	PH

ID	PH

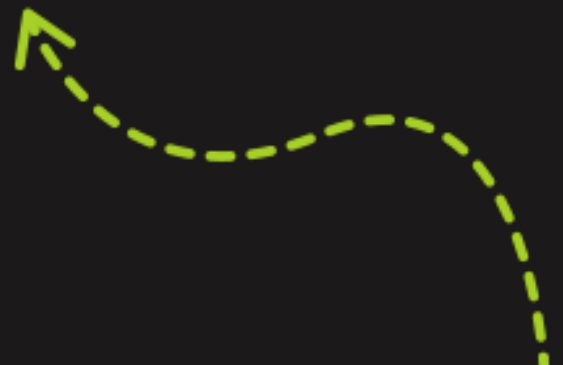
What really happens?

- The accurate nodes will be broadcasting the signals all time wherein the VA's will be on the receiving end, once received the signal by the near most accurate node.
- The accurate node will further update the table for its children nodes with the VA's unique id and +1 to the Pheromone count for that id.
- Following are the set of rules we need to look out for
  - True/ False for the location
  - Timestamp for VAs location
  - Table updation for all the connected child nodes

What really happens?

- The connection highly depends upon the accurate node's pheromone count, more the pheromone count more is the accuracy of location for that id
- And more will be the dependency of a VA on that node.

Sigh, we ideated the Network. Wohooo !



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THANK YOU

Team Sigma X