Swarm Intelligence Course—INFO-H-414

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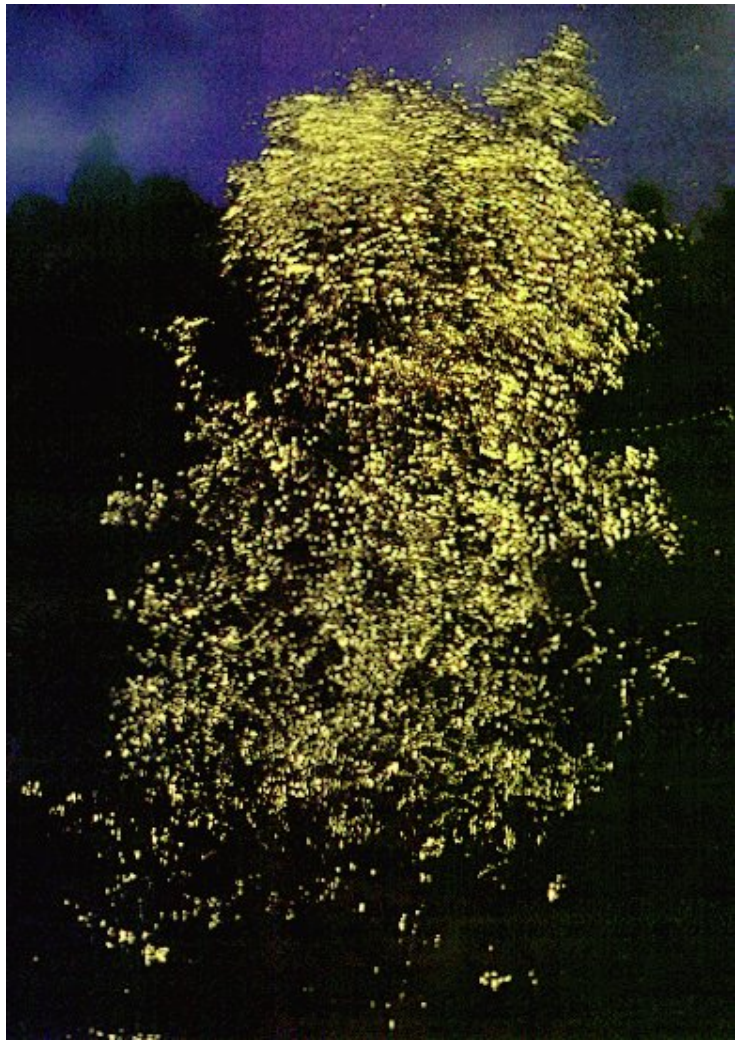
Synchronization



Two video examples:

- `http://youtu.be/sROKYelaWbo`
- `http://youtu.be/a-Vy7NZTGos`

Synchronization: Idea

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HOW?

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HOW? **(propose something!)**

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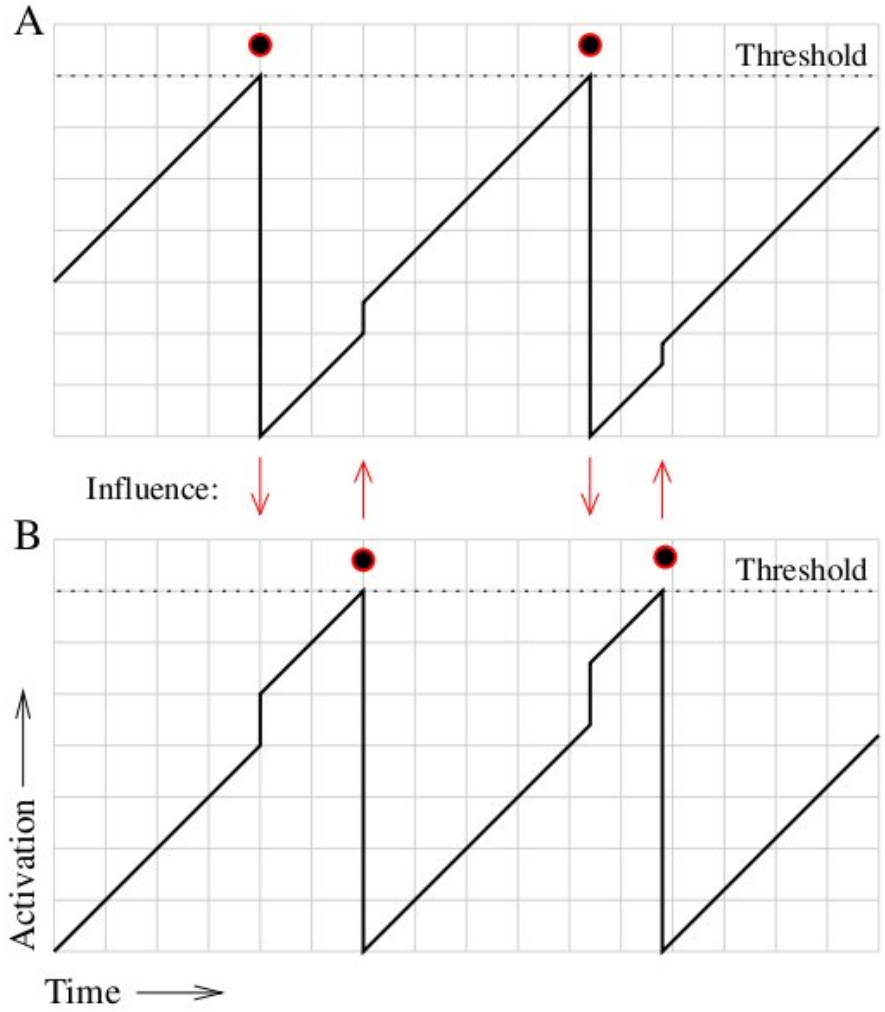
After some time all the robots have the same period $\rightarrow$ **synchronization!**

Synchronization: In Practice



Aggregation: Implementation

```
increase counter

# signaling part
if counter > t_max then
   signal[range_and_bearing and leds]
end
```

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# signaling part
if counter > T_max then
   signal
end

#synchronization
if message_received then
  counter = counter + alpha * counter/beta
end
```

Aggregation: Notes

Suggested values:
$T_{max} = 100$
$alpha = 2$
$beta = 10$

Other notes:

- remember to init the counter to a random value ($< T_{max}$)
- signal with both the range and bearing (for the robots) and the LEDs (for you to see)
- it might be necessary to have an ignore phase after the signal
- there is always a one time-step delay when transmitting

Aggregation: Extra

- What happens if the robots are moving? Is it better? Worse? Why?
- What if the robots have a probability P of missing a message? Does it work? In other words, is this behavior robust to noise?