DUMBO-FIBO
Research Challenges

IntERLAb (AIT) & FIBO (KMUTT)

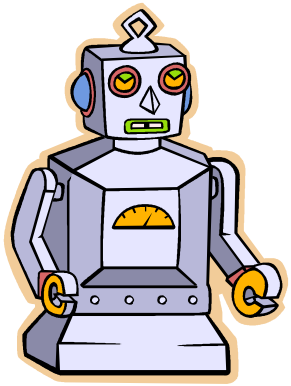
Why do we need both Robotics and Disaster Networking ?

Our few ambitious goals:

- To enable machine-to-machine communication in disaster-affected areas

- To avoid or reduce human exposure to hazardous conditions during a disaster response
  - Radiation (e.g. as in nuclear disaster)
  - Chemicals
  - Explosives

What’re the challenges in Robotic-MANET research



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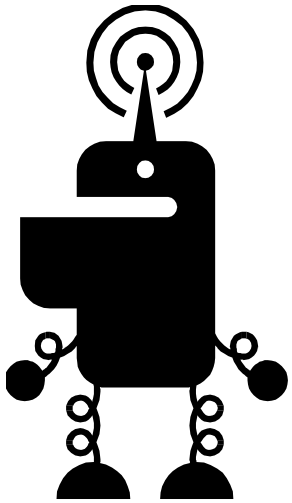
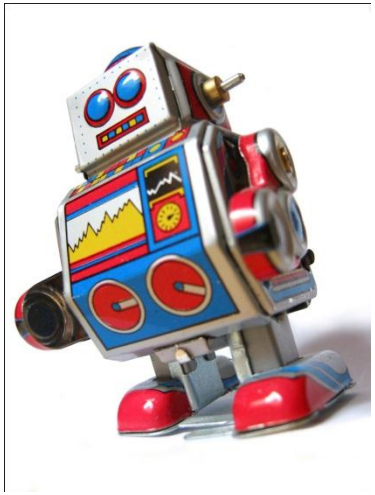
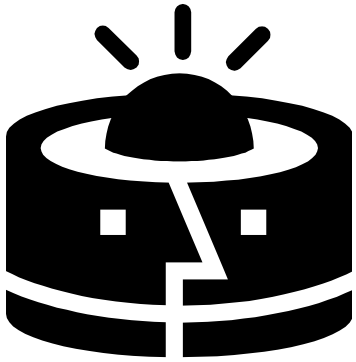
Challenge#1 : Choices of Robots

- Different robot types have different advantages and constraints …

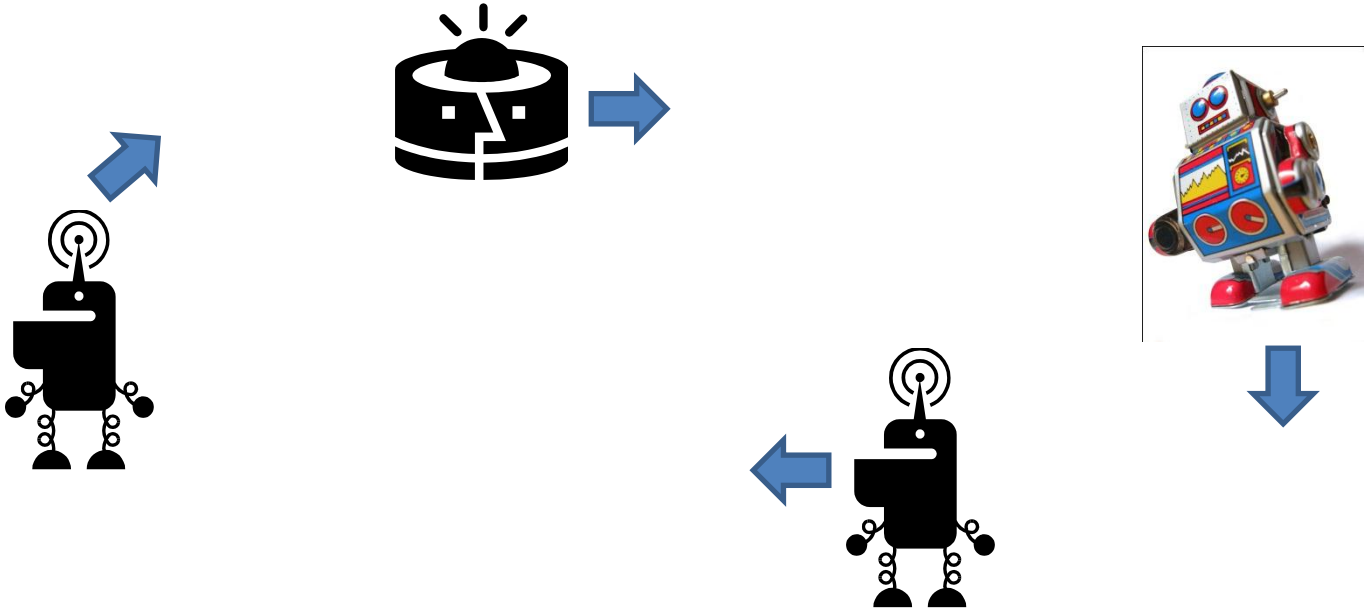






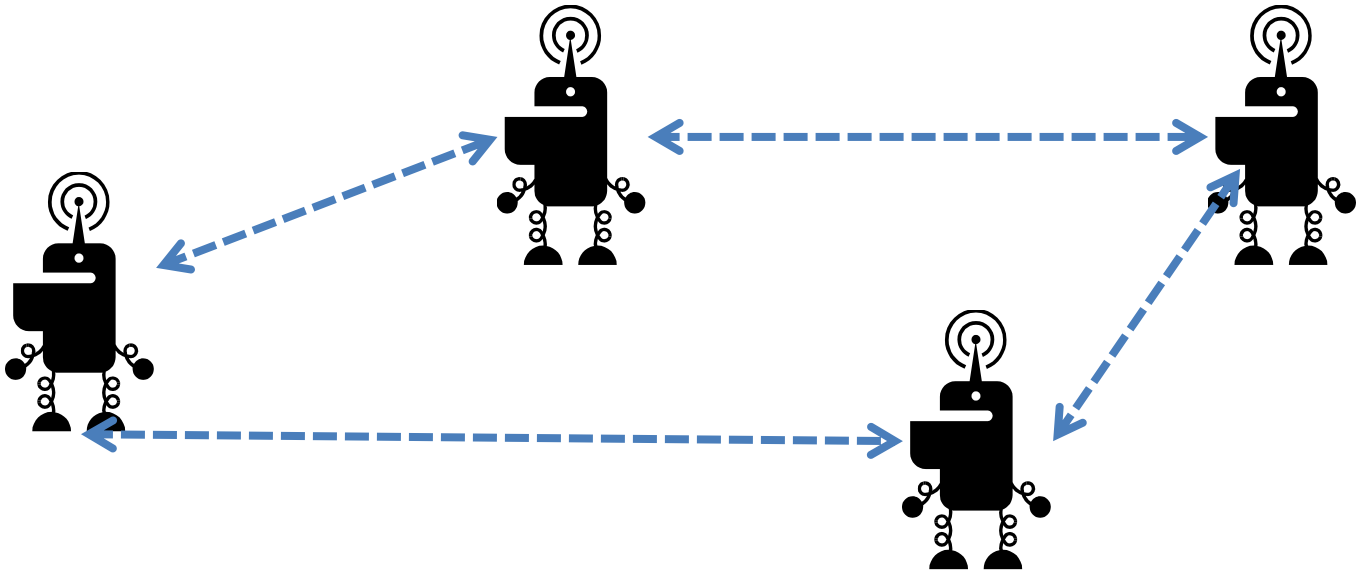
Challenge#2 : Robot Formation

- Robot motion planning
  - From human guided to fully automated approaches …



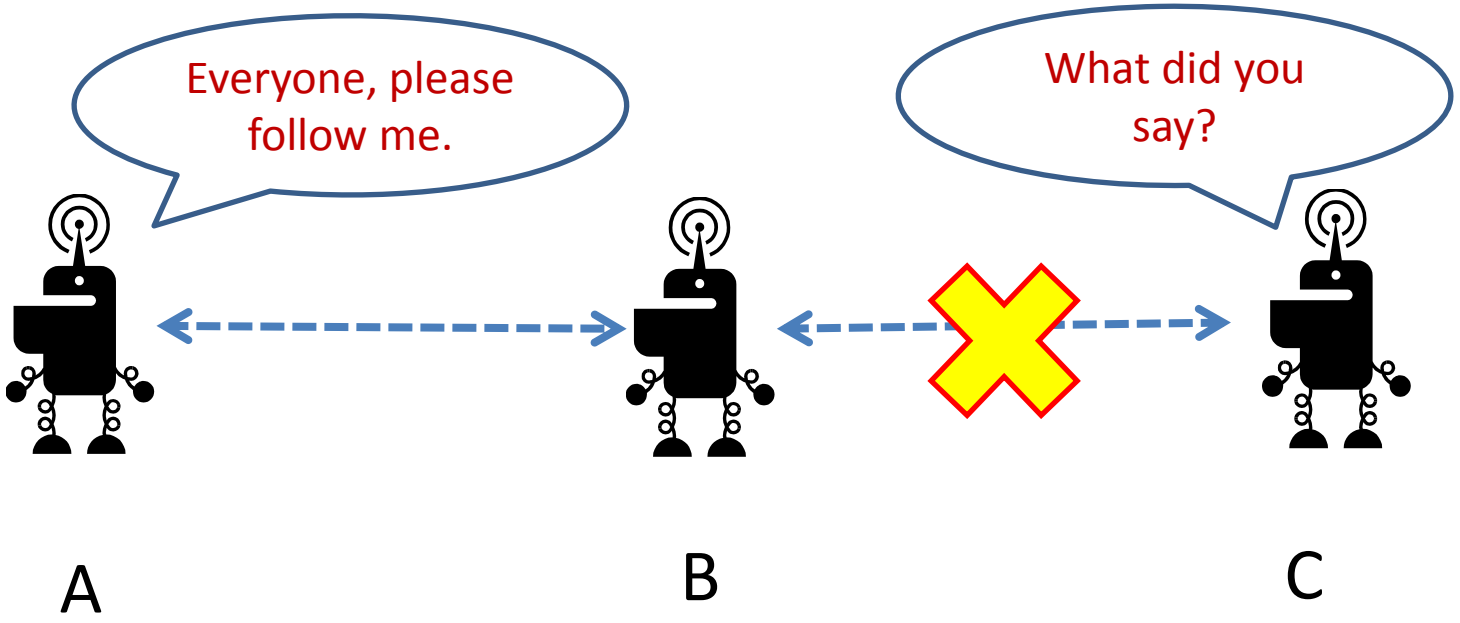
Challenge#3: Inter-robot Communication

- How do we maintain commands and controls ?
  - Each RF transceiver has a limited range.
  - Multi-hopped RF communication is preferred



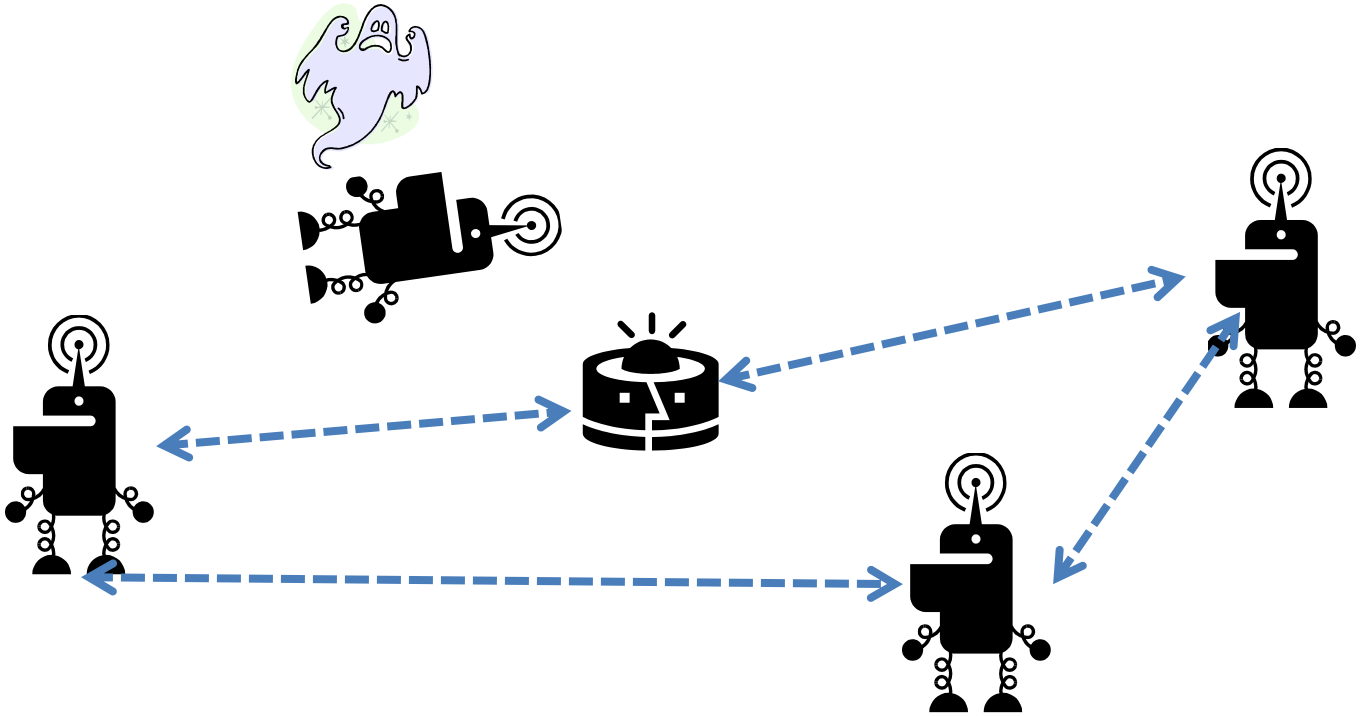
Challenge#4: Disruption Tolerance

- 4.1 MANET communication is very disruptive in nature
  - How much autonomy does each robot need ?



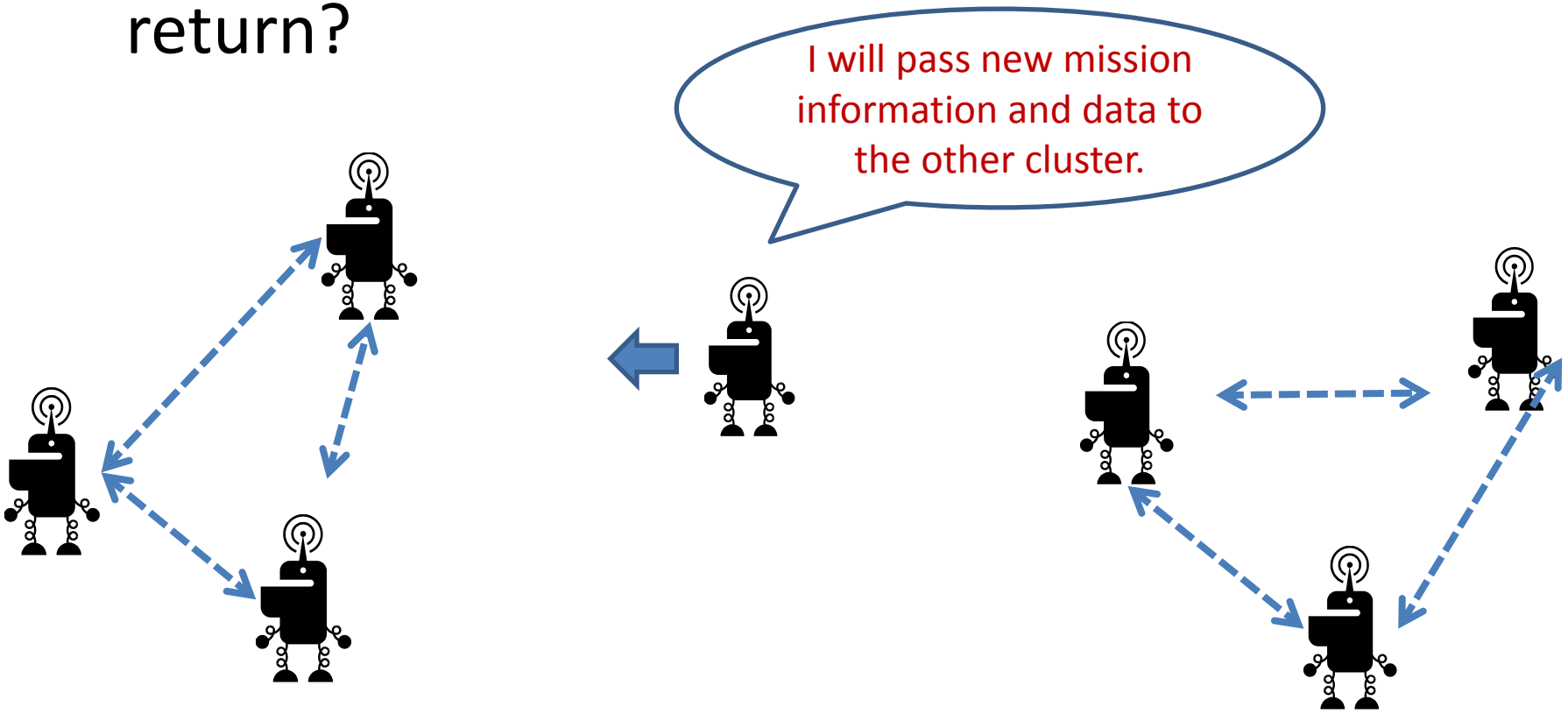
Challenge#4: Disruption Tolerance

- 4.2 What if some robots just die ?
  - Can the surviving or new ones take over ?



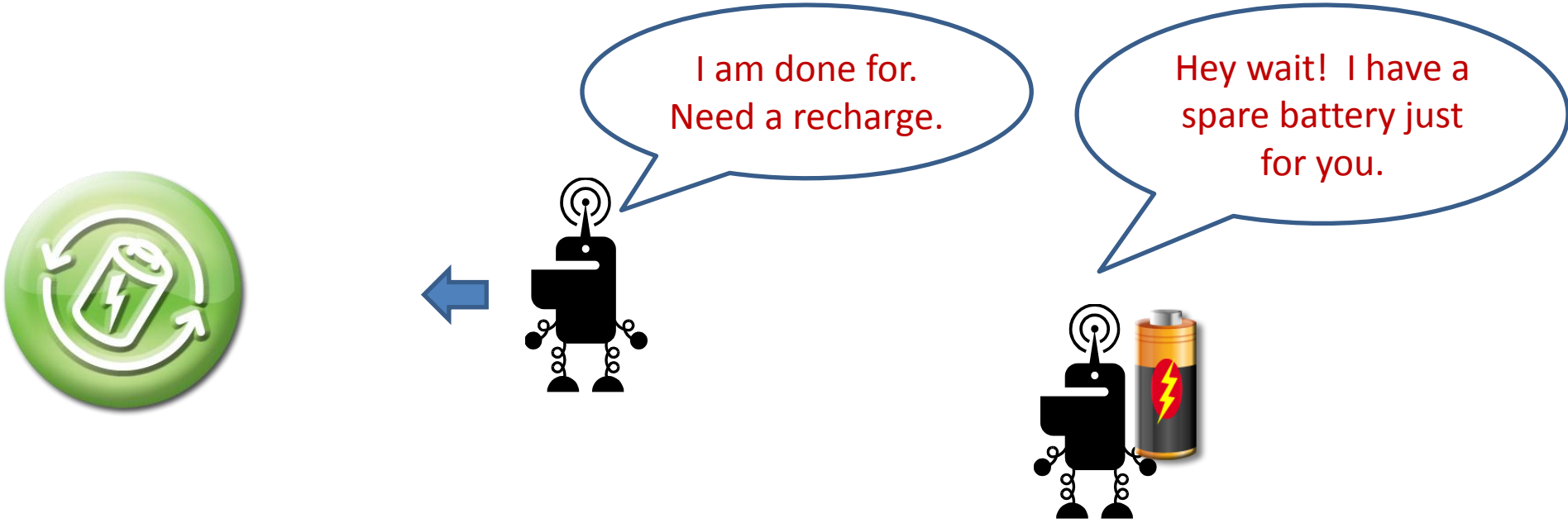
Challenge#4: Disruption Tolerance

- 4.3 On a mission, would you allow some robots to leave a network and probably later return?



Challenge#5 : Everything needs POWER!

- Can we take power management and power logistics into robot motion planning ?



The Greatest Challenge: The Mission Itself

THANK YOU FOR YOUR ATTENTION

NEXT … OUR ROBOTIC EXPERT WILL REVEAL MORE CHALLENGES ..