

Bear Robotics
Our Last Meeting

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The Field of Robotics is Diverse and International ...

- ▣ **Robots are Explorers:** Earth's ocean depths, the surface of Mars, and active volcanoes ... places challenging or dangerous for humans.
- ▣ **Robots are Assemblers:** automobiles, computers, televisions, and many other products.
- ▣ **Robots are Small or Mighty:** the size of your thumbnail or as big as a earth-hauling truck.
- ▣ **Robots have Behaviors:** mimic insects, animals, and humans.
- ▣ **Robots Cooperate:** operate in teams or swarms.
- ▣ **Such achievements are due to individuals around the world who are pioneering robotics every day.**

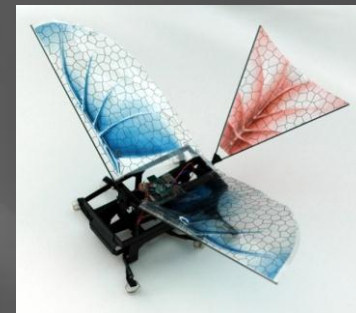
Pioneers of Artificial Intelligence

- Over the past eighty years, since Alan Turing's WWII work, many smart people have expanded the field of artificial intelligence.
- Four significant early pioneers were:
 - Allen Newell, (1927-1992), Carnegie Mellon
 - Herb Simon (1916-2001), Carnegie Mellon
 - John McCarthy (1927-2011), Stanford
 - Marvin Minsky (1927), MIT



Insect Robots

- While many individuals focused on artificial human-like intelligence, others chose to mimic bugs, birds, and other animals in robotics.
- Rod Brooks at MIT is regarded as the pioneer of insect robotics.
- Smart people at universities around the world have since evolved insect robotics. (Flying robot from UC Berkeley.)
- Insect Robotics has advanced from mimicking individual behavior to demonstrating swarm “intelligence.” (Crawling insect from MIT’s iSwarm.)
- Swarm Intelligence is a “hot field” of research.



Bear Robotics may have taught you the following ...

- ▣ **A robot is a complex system:**
 - **Structure, Moving Parts, Sensors, Mechanisms, Energy/Power, and Software**
 - **All pieces must work well together to be successful**
- ▣ **Building a robot can be a challenging, frustrating experience.**
- ▣ **Software requires patience ... write, test, analyze (repeat many times).**
- ▣ **Turning your ideas into a robot requires teamwork.**
- ▣ **Success can be very rewarding.**

You have taught me ...

- ▣ You are a smart, nice group of robotics inventors.
- ▣ Mr. Ondi is a good teacher and mentor.
- ▣ Improvements to the Club:
 - Provide more links, more often to examples of other robots built with Mindstorm.
 - Find examples of successful Mindstorm software and dedicate one lecture on how to program with it.
 - Encourage middle school and high school robotics club members to mentor students in Bear Robotics.
- ▣ On a personal note, you have brought me great joy and memories. I will miss each of you.

Thank You for Listening



References & Links

- ▣ <http://diva.library.cmu.edu/Simon/>
- ▣ <http://diva.library.cmu.edu/Newell/biography.html>
- ▣ [http://en.wikipedia.org/wiki/John_McCarthy_\(computer_scientist\)](http://en.wikipedia.org/wiki/John_McCarthy_(computer_scientist))
- ▣ <http://www.learnaboutrobots.com/bugs.htm>