Integrating Robotic and Human Exploration

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Robotic and Human Exploration

- Space
- Military
- Homeland Defense
- Manufacturing
- Medical
- Commercial

What is the role of science and technology? Near, Mid and Far Term?
Robotic and Human Exploration

• Generation Robots:
  – First Generation
    • Intellectual Capacity, Lizard.......2010
  – Second Generation
    • Intellectual Capacity, Mouse.......2020
  – Third Generation
    • Intellectual Capacity, Monkey.......2030
  – Fourth Generation
    • Intellectual Capacity, Human.......2040 - 2050

Hans Moravec, CMU RI, 1997
Systems Approach

Power – organic garbage
Actuation – elastic, shape memory alloys, electroactive polymers
Sensing – haptic, vision, effectors
Locomotion – hopping, skating, slithering
HR Interaction – visual, speech, socialization
Intelligence & Autonomy
Software Intensive!
Robotic and Human Exploration

• Systems Approach
• Intelligence
• Complex Environments

It will take:
  – National priority
  – Resourcing
  – Time

Innovative System Solutions

It will be revolutionary and yield huge ROI