A Perspective on Robotics

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A Tale of What Could Have Been

• In 1984 I was completely excited by the field of robotics when I was an undergraduate student in mechanical engineering at King’s College London

• I even did my Senior Thesis on Robotics working with Prof. Stan Earles

• For me the programming of the robotic arm and the photo-detection of motion gave me lots of room to play and learn how to engage in research

• I almost went to Stanford to study robotics and artificial intelligence

• I even imagined a future in which robotics would control much of what would happen in the next 30 years beyond....

• However we over-estimated the potential in the short term...
Programming of a Robot Arm

- Project combined elements of solid mechanics, programming, algorithm development, computer vision and design
- Supervised by Stan Earles
- Sponsored by the Ford Motor Company

Figure 1. Stereo vision system scheme.
Robotics in the Real World....

• By 1985 everyone thought that robotics would revolutionize the world

• However the impact of robotics was modest in the short term

• Amara’s Law – We tend to overestimate the effect of technology in the short run while we underestimate the effects of technology in the short run

• Recent example of Amazon Robotics
Inspiring Young People and a New STEM Culture: Battlecry WPI/Africa
Robotics – A Source of Inspiration for STEM to Young People

• Robotics is a source of inspiration for young people to pursue STEM
• This has been recognized Dean Kamen (WPI Alum) and founder of FIRST Robotics ...
  • Alloys
  • Semiconductors
  • Polymers
  • ...

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FIRST and FIRST Global Robotics

- First was developed by Dean Kamen and Prof. Flowers of MIT to inspire young people to explore careers in STEM

- The idea was to use extracurricular activities to engage students in STEM without a direct focus on the study of the actual subjects

- Instead the students work on robotics projects as part of teams across several high schools across the world

- More recent efforts have expanded the scope of FIRST to FIRST Global which is a new initiative to further engage the world in robotics

- WPI has worked closely with FIRST and FIRST Global since their inception
Introduction to FIRST Global

FIRST Global

- A new idea by Dean Kamen to further engage the world in robotics
- Similar to the Olympic Games of Robotics
- Event to be held in Washington DC in July
- Strong effort to recruit teams from Africa
- Key role of WPI in mentoring teams and supporting this initiative
Robotics in Africa

- Tremendous interest in robotics across Africa
- Several countries participating in FIRST Global
- Strong efforts in Kenya, Ghana, Senegal, Rwanda, Zimbabwe...
- Need to build on these efforts to encourage the youth to pursue STEM fields
Introduction of MS4SSA Robotics Modules

• Build on WPI’s rich history of STEM outreach to schools
• Introduce three components of robotics
• Extend this to Battlecry WPI/Africa
• Inspire young Africans and their families to enjoy STEM culture

• The components of WPI MS4SSA Robotics Program
  • Hands-on sessions
  • Programming
  • Mechanisms
  • 3D Printing/Rapid Prototyping
  • Perspectives
Summary and Concluding Remarks

• This talk presents a perspective on robotics

• First the evolution of robotics is presented over the past 30 years – my personal perspective!

• This was followed by a discussion of the role of robotics in stimulating the interest of youth in STEM fields

• The role of FIRST Robotics and Global FIRST Robotics was also explored

• This was followed by a review of robotics within an integrated context (programming, mechanisms and rapid prototyping) – emerging interest and opportunity

• We look forward to engaging all African countries in WPI’s MS4SSA modules on robotics.....
THANK YOU!

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