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 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
  - Vision
  - Mechanisms
  - Robotics in Africa
  - 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 African context – emerging interest and opportunity
• We look forward to engaging all African countries in WPI’s MS4SSA modules on robotics.....
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