Tampere University
Tampere University of Applied Sciences

Business Finland – CERN collaboration

Robotics & AI

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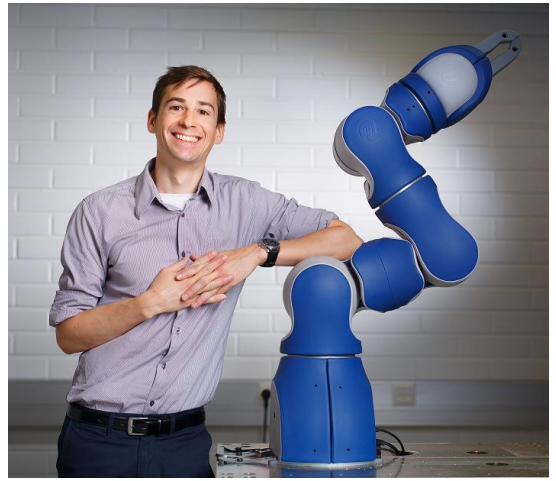
Background



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CERN: Current and future problems

- My perspective, based on discussion, current R&D and state-of-the-art
- Video link Presentation link

Current LHC:

- Remote intervention: maintenance, inspection, handling
- Robot tele-operation: object manipulation, localization/mapping
- Perception: tele-presence, detection/recognition, AR/VR,

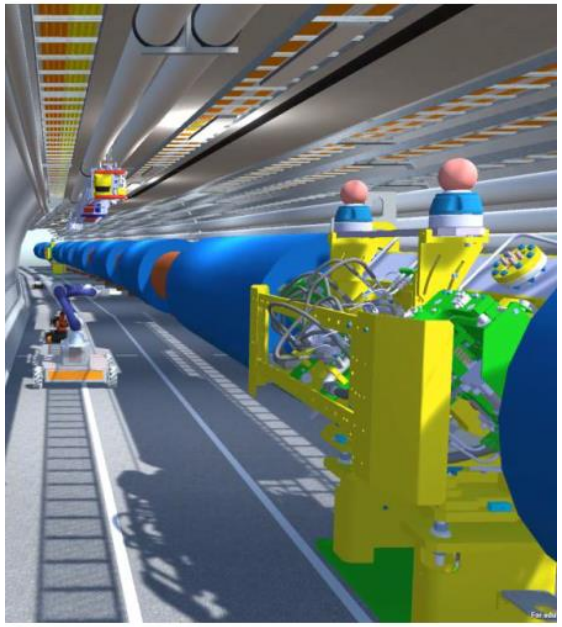
Future:

- LHC/FCC: maintenance, inspection of future infrastructures

Conclusion:

- CERN can serve as test-bed, facilitator, knowledge resource
- Long-term commitment is key

CERN-bot



Virtual LHC tunnel + robot

Targeted topics/needs: Remote, enhanced tele-operation

- Robotics: mobile base + arm
- AI: virtual/augmented reality interaction
- Augmented Man: human assistance and training

Towards inspection and maintenance of infrastructure/objects

CERN tunnel environment

Virtual Reality interaction

Current TAU-CERN activities

- Research with CERN robotics group (Engineering Department (EN))
  1 researcher + 2 in future
- Intent to participate in CERN EP R&D 5 year plan
- ATTRACT proposal

- Co-Creation → Co-Innovation

BF Co-Innovation: Current state and potential

- Discussion with multiple companies:
- Clear interest in:
  - **Robotic tele-operation + Augmented/Virtual Reality**
  - **Remote object handling**
  - **Object/infrastructure inspection, personnel training**

- Core competence of companies does not necessarily relate to CERN, but their problems and needs do!
- Companies cannot do R&D without BIC!
- Common interests are these problems, and CERN as potential business facilitator/motivator

BF Co-Innovation: Next steps

- Get company commitment
- Refine and narrow down on topics
- Ensure that CERN benefits as well
- Coordinate among other BIC collaboration projects/proposals

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Thank You!