

International Study Visit, CERTH, Greece 11-13 Feb 2020

Bogazici University

Turan Mehmet

mehmet.turan@boun.edu.tr



International Study Visits of TARAL to EU Key Players

Research interests

- Leading Medical robotics and Artificial Intelligence Lab at the Institute of Biomedical Engineering
- Team members: 5 PhD students, 2 master students
- External collaborators: Prof. Dr. Mehmet Fatih Yanık (ETH Zurich), Dr. Faisal Mahmood (Harvard University, USA), Dr. Hunter Gilbert (Louisiana State University, USA), Yasin Almalioglu (Oxford University, UK)
- Distinctions:
- Distinctions/Research areas / activities:
 - Simultaneous Localization, Mapping and Navigation for Endoscopic Capsule Robots, Reinforcement Learning for control of complex-to-model medical robotic systems.
 - Medical Image-2-Image translation using deep learning (supervised, unsupervised and weakly supervised) rgb-2-depth, low-2-high, segmentation, synthetic data generation etc.

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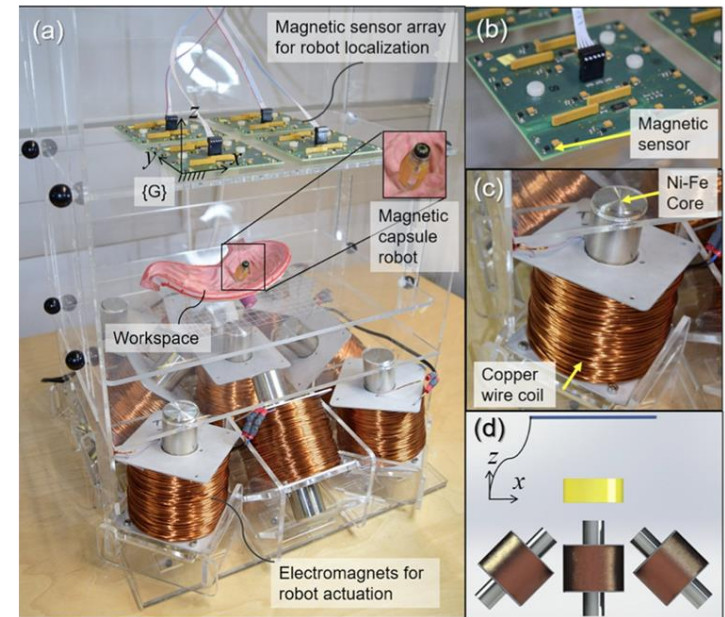
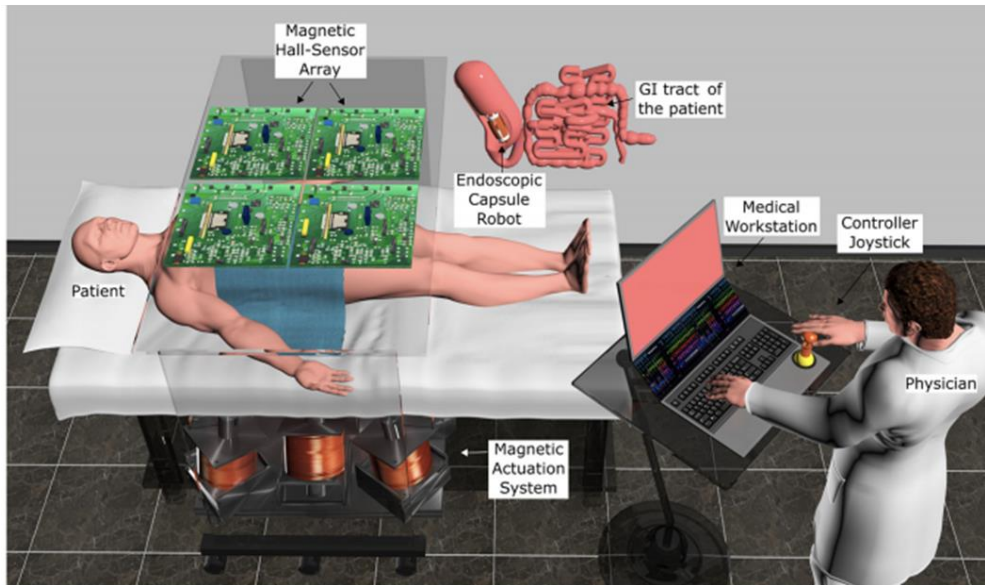
AI-powered computational pathology

-Interested in utilize artificial intelligence and medical image analysis to develop streamlined workflows for cancer diagnosis, prognosis, and reducing interobserver and intraobserver variability in cancer diagnosis

-Combining information from multiple imaging modalities, familial and patient histories and multi-omics data to make more precise diagnostic, prognostic and therapeutic determinations

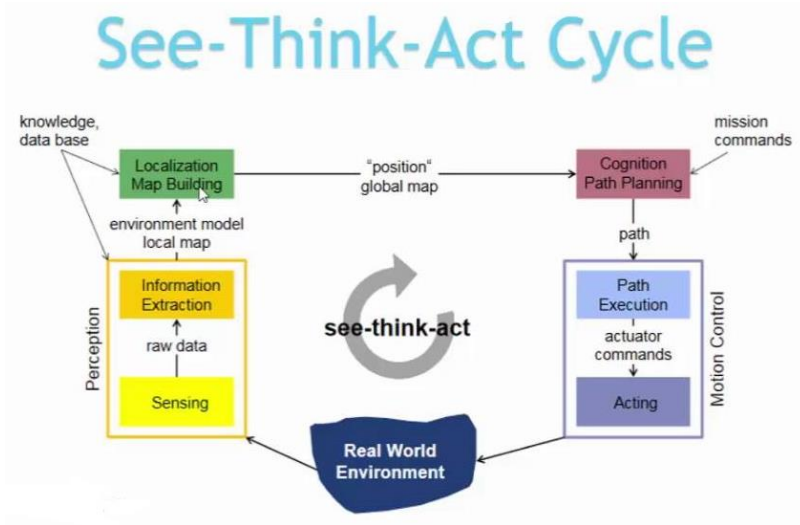
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Active Capsule Endoscopy



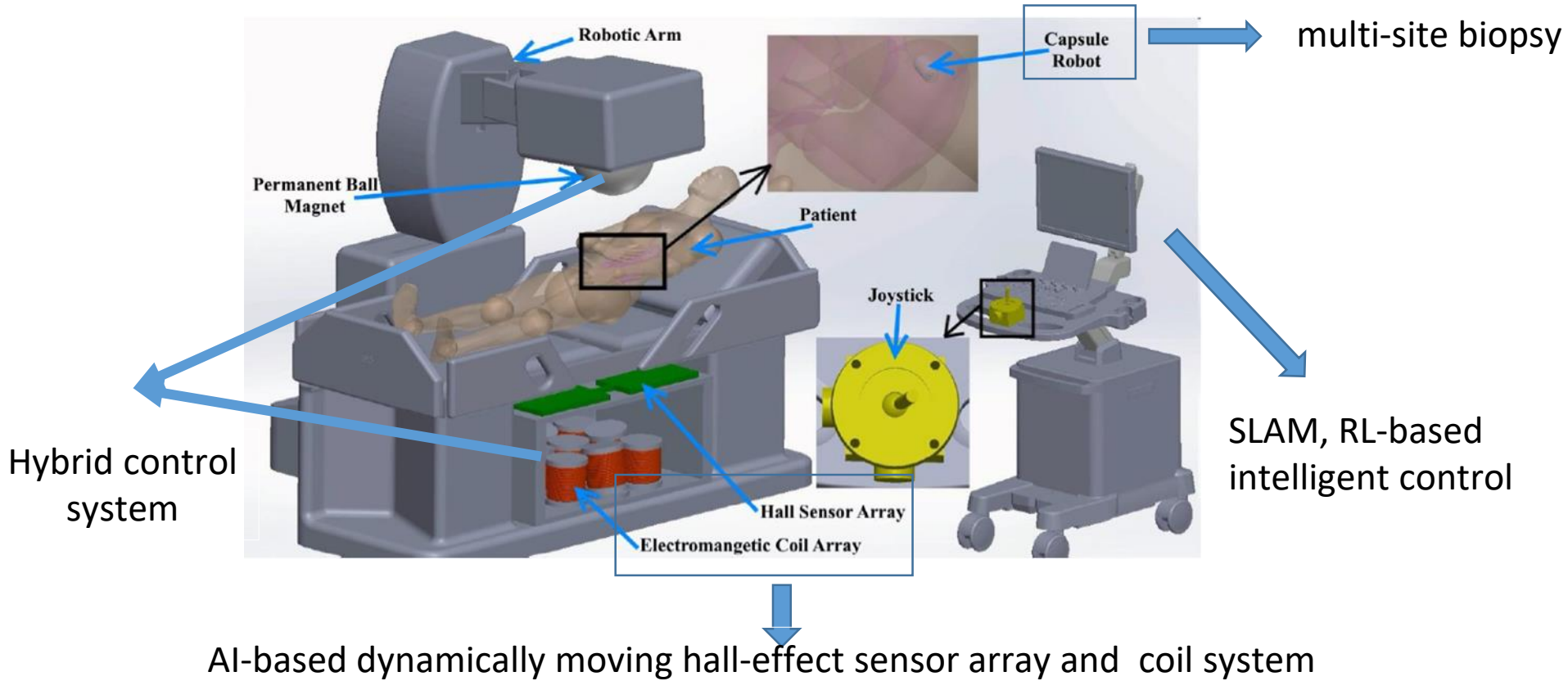
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Autonomous Endoscopic 3D Scanner



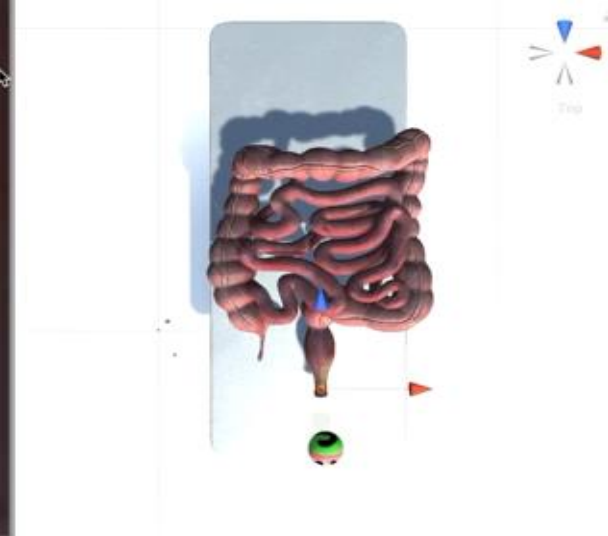
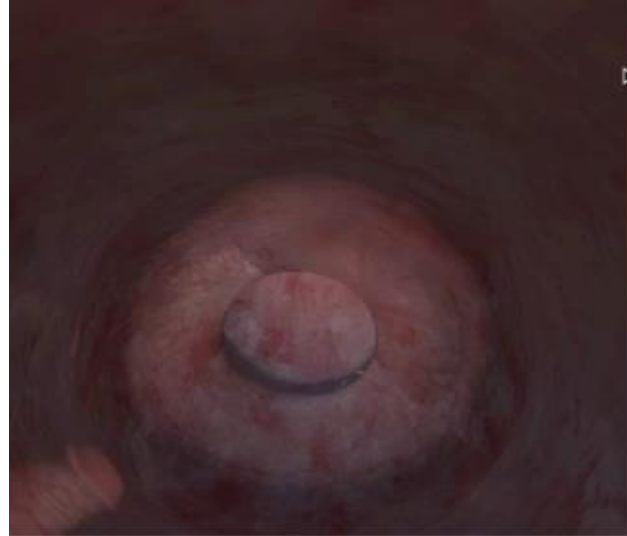
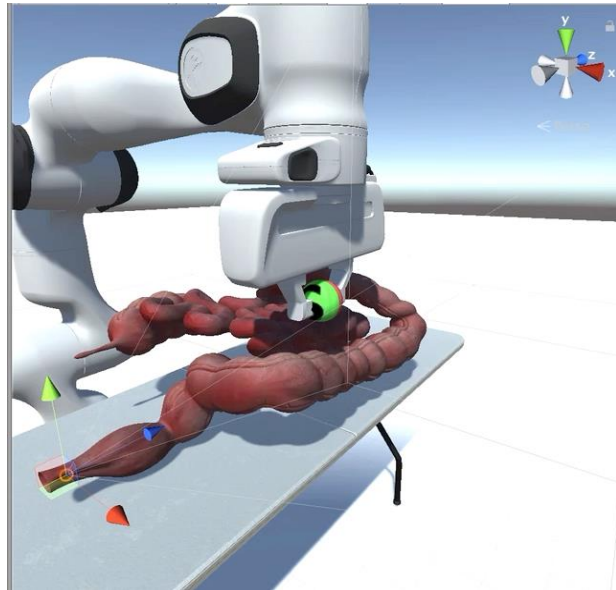
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New concepts of coarse-to-fine actuation and multi-site biopsy



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Sim2Real transfer using Unity



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R&D References

Mention the projects you have coordinated or participated (focus on EU grants).

- 2232 Tubitak Fellowship Program for Outstanding International Researchers
- iNavigate: Brain-inspired technologies for intelligent navigation and mobility
Coordinated by Stichting Katholieke Universiteit

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Collaboration Offer

What can you bring to a consortium?

- Deep learning, reinforcement learning, medical image analysis, robotic control, transfer learning, domain adaptation, domain randomization, Specific experiences, knowledge, references
- Do you already have an idea? How mature is it? → 2 projects
- Connections from ETH Zurich, EPFL, Oxford and Harvard

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Interested in calls:

- Personalized early risk prediction, prevention and intervention based on Artificial Intelligence and Big Data technologies
- Accelerating the uptake of computer simulations for testing medicines and medical devices : **3D scanner endoscopia capsule simulation environment using Maya, Unity, Blender, Unreal (mature idea)**
- Digital Diagnostics – developing tools for supporting clinical decisions by integrating various diagnostic data:
An Integrated Framework for Fusing Histopathology and Genomic Features for Cancer Diagnosis and Prognosis (immature yet)
- AI for Genomics and Personalized Medicine)

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Turan Mehmet
Bogazici University
Institute for Biomedical Engineering
Turkey
+90 5301198970
mehmet.turan@boun.edu.tr

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