TECH4EU CONSTRUCTION

AI AND ROBOTICS IN CONSTRUCTION

EUROPEAN ROBOTICS FORUM
eu ROBOTICS at the heart

13 March 2024
Rimini Italy

ORGANIZERS

Jason RAMBACH
DFKI

Antonio Alonso CEPEDA
ACCIONA

Dimitrios GIAKOUMIS
CERTH-ITI

RoBétARME humantech BEEYONDERS

Funded by
the European Union

AGENDA

13 MARCH 2024
16:40 - 18:00

16:40-16:42 ▶ **WELCOME AND INTRO BY ORGANIZERS**

16:43-17:02 ▶ **PRESENTATIONS OF PROJECTS HUMANTECH, BEEYONDERS, ROBETARME BY THE COORDINATORS**

17:03-17:33 ▶ **ADVANCES IN ROBOT VISION, NAVIGATION, CONTROL AND HRI TOWARDS NEW ROBOTIC SOLUTIONS IN CONSTRUCTION**

- **RobotVision in RobetArme**
  Renaud Detry, KU Leuven
- **Human-Robot Interfaces in Construction**
  Dr. Gabor Sziebig, HumanTech - SINTEF
- **Robot Vision in Autonomous Machinery**
  Dra. María Teresa Lázaro, BEEYONDERS - ITAINNOVA

17:34-17:44 ▶ **INSIGHTS FROM THE FIRST USER EVALUATION IN HUMANTECH**

17:45-17:55 ▶ **ROUND TABLE - LESSONS LEARNED AND CHALLENGES FROM ROBOTIC PROJECTS IN CONSTRUCTION**

- **Prof. Herman Bruyninckx**
  KU Leuven
- **Dr. Gabor Sziebig**
  SINTEF
- **Dr. Sascha Wischniewski**
  Baua
- **José Carlos Jiménez-Fernández**
  Tecnalia
- **Mr. Alberto Landini**
  STAM

17:56-18:00 ▶ **FEEDBACK ROUND WITH ATTENDEES**

ORGANIZERS

Dr. Jason RAMBACH

HumanTech project Coordinator

JOB TITLE
Senior Researcher, Team Leader Spatial Sensing and Machine Perception

AFFILIATION
German Research Center for Artificial Intelligence, DFKI

BIO
Jason Rambach received his PhD in Computer Science in 2020 from the University of Kaiserslautern for his dissertation entitled “Learning Priors for Augmented Reality Tracking and Scene Understanding”. He has been at DFKI Augmented Vision in Kaiserslautern since 2015. Currently, he is a Senior Researcher leading the team “Spatial Sensing and Machine Perception” of approx. 10 researchers working on depth sensing and Geometric/Semantic scene understanding using Machine Learning.

His research interests include SLAM and Semantic Scene Understanding, Object Pose Estimation and Tracking, Anomaly Detection, Hybrid AI, Robotic Vision and Augmented Reality. He has over 40 publications in leading Computer Vision and Augmented Reality conferences, a best paper award from the IEEE International Symposium on Mixed and Augmented Reality (ISMAR) 2017 and two awards at the BOP Object Pose Estimation challenge 2022 at ECCV. He is a reviewer for several scientific journals and conferences (CVPR, ECCV, ICRA, WACV, BMVC). Since 2022 he is coordinator of the EU Horizon Project HumanTech, applying AI in the construction industry for Scan2BIM, Wearables and Assistance Robots.

Antonio Alonso CEPEDA

Beeyonders project Coordinator

JOB TITLE
Innovation manager

AFFILIATION
ACCIONA Construction

BIO
MSc Industrial Engineer in Energetic Technologies and PMP. His technical background is based on two fields of knowledge:

1. Computer fluid mechanics and thermal analysis, developing algorithms to optimize engineering systems behavior applied to Energy E ciency in Buildings, and

2. Robotics, working in the development of different prototypes for construction, and giving support to the company in Digital Transformation for Construction. His managing background has been focused on the ICT and Automation area into the technological Innovation Direction in Madrid (ACCIONA), giving dvice to strategic decisions, new research lines, and managing groups of researchers. During these years, he has worked in several European projects related to Energy E ciency and Robotics. Currently, he is the Project Manager of BEEYONDERS, which involves 21 partners with a budget of 8 M€ and 3.5 years.

Dr. Dimitrios GIAKOUMIS

RobetArme project Coordinator

JOB TITLE
Researcher (Grade C)

AFFILIATION
Centre for Research and Technology Hellas (CERTH)

BIO
Dr. Dimitrios Giakoumis is a Senior Researcher (Grade C') at the Information Technologies Institute of the Centre for Research and Technology Hellas (CERTH).

His main research interests include human-robot interaction, robot vision, service robot perception and cognition, affective computing, human motion, activity and behaviour analysis and modelling, safe and social-aware robot navigation, biosignals processing and sensor management, multimodal interfaces, machine learning and pattern recognition.

He has been working as a Researcher with ITI since February 2007 and he has been involved in more than 15 research projects, funded by the EC and the Greek Secreteriat of Research and Technology. These include the Horizon 2020 RAMCIP, BADGER, HR-Recycler, Ageing@work and BACCHUS projects, where he also contributed to the Technical Coordination and Quality Management of the project consortium.

SPEAKERS

Renaud Detry

JOB TITLE
Associate Professor of Embodied Learning

AFFILIATION
KULeuven

BIO
Renaud Detry is an Associate Professor of Embodied Learning at KULeuven, Belgium. His research interests are in perception and learning for robot manipulation and mobility, for terrestrial and planetary applications. Formerly Detry was a research scientist and the group lead for Perception Systems at NASA's Jet Propulsion Laboratory (JPL, 2016-2021).
At JPL, Detry was the machine-vision lead for the Mars Sample Return campaign, and conducted research in autonomous robot mobility, navigation, sampling, climbing for the exploration of Mars, Europa, Enceladus, and the Moon. Prior to JPL, Detry was a post-doc at KTH/Stockholm and ULiege (2010-2016). The work focused on the development of robot agents that learn to predict object graspability from visual data. Detry earned his Master's and Ph.D. degrees in computer engineering and robot learning from ULiege in 2006 and 2010.

Gabor Sziebig

JOB TITLE
Research Manager

AFFILIATION
SINTEF Manufacturing

BIO
Gabor Sziebig (Senior Member, IEEE) received the M.Sc. degree in computer science from the Budapest University of Technology and Economics, Budapest, Hungary, in 2007, and the Ph.D. degree in production engineering from the Norwegian University of Science (NTNU), Trondheim, Norway, in 2013.
He is currently a Research Manager with SINTEF Manufacturing and also part-time Associate Professor with the Department of Industrial Engineering, Faculty of Engineering Science and Technology, UiT The Arctic University of Norway. His research fields are automation, robotics, computer vision, and control theory. During his Ph.D. studies, he was focusing on novel programming methods for Flexible Manufacturing Systems and have developed a concept called small-scale intelligent manufacturing systems (SIMS).

María Teresa Lázaro

JOB TITLE
R&D Engineer

AFFILIATION
Aragon Institute of Technology

BIO
Dr. Maria Teresa Lázaro received her PhD in Computer Science and Systems Engineering in 2015. Her PhD thesis was entitled: "Map building, localization and exploration for multi-robot systems". Member of the Robotics Team at the Aragon Institute of Technology (ITA) since 2018, from 2015 to 2018 she worked as post-doctoral researcher at the DIAG Department of La Sapienza University of Rome. Previously, she worked from 2006 to 2015 as pre-doctoral researcher at DIIS Department of Universidad de Zaragoza, Spain.
During her career she has participated in several European projects and Spanish and Italian national projects and contributed to multiple international robotics dissemination events. She is also an active reviewer for several journals and conferences (T-RO, T-ASE, RA-L, IROS, ICRA, ...) and has served as associate editor for three editions of the IEEE ICRA conference. Currently, she is also principal investigator of the Robotics, Mechatronics and MBSE research group at ITA.
Her main research areas include autonomous mobile robots in general, focusing on the localization and mapping problem in unknown and dynamic environments by single and multi-robot systems. Her recent research involves the application of large-scale and long-term Simultaneous Localization and Mapping techniques to autonomous vehicles and industrial machinery, including operation in low visibility scenarios.

Patricia Helen Rosen

JOB TITLE
Research team lead "Physical work assistance", Unit "Human Factors, Ergonomics"

AFFILIATION
Federal Institute for Occupational Safety and Health (BAuA)

BIO
Patricia Helen Rosen is a researcher within the unit “Human Factors, Ergonomics” at the German Federal Institute for Occupational Safety and Health (BAuA). She has a degree in psychology and a PhD. Her areas of expertise are human-centred workplace design and human-robot interaction (HRI). Her research focuses on cognitive ergonomics and mental states in relation to HRI, such as the assessment of HRI quality or task design in HRI teams. Within the unit “Human Factors, Economics” she leads the research team "Physical work assistance". She is one of the young delegates of the German Society for Human Factors (GfA-NEXT) and an active member of the Technical Committee Human Factors in Robotics of the International Ergonomics Association (IEA).

ROUND TABLE PARTICIPANTS

Prof. Dr. ir. Herman Bruyninckx

JOB TITLE
Robotics researcher and educator

AFFILIATION
KU Leuven
Eindhoven University of Technology

BIO
Prof. Dr. ir. Herman Bruyninckx is a distinguished robotics researcher and educator. He is a Full Professor at KU Leuven and holds a Part-time Full Professorship at Eindhoven University of Technology. Prof. Bruyninckx is a strong advocate of open standards and vendor-neutral software engineering in robotics. He has contributed to the development of groundbreaking open-source software for real-time, distributed, and heterogeneous robotics applications. He emphasizes the importance of providing robots with high-level context and advocates for an integrated approach across multiple levels of abstraction. He is also working on an online book titled "Building Blocks for Complicated and Situational Aware Robotic and Cyber-Physical Systems," which aims to disseminate his insights beyond the confines of conventional publications.

Sascha Wischniewski

JOB TITLE
Head of Unit "Human Factors, Ergonomics"

AFFILIATION
Federal Institute for Occupational Safety and Health (BAuA)

BIO
Dr. Sascha Wischniewski is head of the unit "Human Factors, Ergonomics" at the German Federal Institute for Occupational Safety and Health (BAuA).
His fields of expertise are anthropometry and digital human modelling, ergonomics of smart information and communication technologies and human factors in robotics.
Dr. Wischniewski is a graduate engineer in mechanical engineering from and holds a doctoral degree in industrial engineering. His work focuses on human-technology interaction in the working world with special emphasis on innovative technologies for physical and cognitive work assistance.
Dr. Wischniewski co-leads BAuA's focus programme on occupational safety & health in the digital world of work. He is active in standardization and currently chair of the Technical Committee Human Factors in Robotics of the International Ergonomics Association (IEA). Dr. Wischniewski is member of the board of the German Ergonomics Association (GfA) and the German Federal Association for Occupational Safety and Health (basi).

José Carlos Jiménez-Fernández

JOB TITLE
Technologist Researcher

AFFILIATION
Tecnalia

BIO
BIO Msc in Civil Engineering and Finite Element Analysis. Technologist researcher in Tecnalia Research & Development, with active participation in other EU-funded project focused in civil construction research and structural health monitoring.

Alberto Landini

JOB TITLE
Senior Project Manager

AFFILIATION
Stam s.r.l.

BIO
Mr Alberto Landini, (male) is a Robotics Engineer. He is a Project Manager in Stam, where he is responsible for the technical development of the Robotics and Mechatronics department. He and has participated in and managed several European, National and Regional research projects, dealing mainly with robotics and automation solutions, mechatronic design, IoT solutions, industrial processes control and optimization, and aerospace.

Gabor Sziebig

JOB TITLE
Research Manager

AFFILIATION
SINTEF Manufacturing

TECH4EU CONSTRUCTION

RoBetARME humantech BEEYONDERS

Funded by
the European Union