robotics Swiss National Centre of Competence in Research

COMMUNITY NEWSLETTER

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Public Version

In this issue...

LATEST NCCR NEWS

Swiss Robotics Day - 2 November in Zurich

The 2021 edition of NCCR Robotics' flagship event will take place on 2 November at the Stage One Event and Convention Hall in Zurich. It is Switzerland's most comprehensive exhibition on robotics for service sectors, and brings together industry, researchers, investors, engineers and students to exchange and share experiences, new ideas, and technologies. Matchmaking sessions facilitate collaborations and partnerships. Presentations of distinguished speakers will focus on innovative technologies, new market trends for robots, logistics, the future of aerial robotics and robots in healthcare. Registration is now open. More information on the event on the dedicated website.

Josie Hughes joins NCCR Robotics as Associate PI

Josie Hughes, head of the Computational Robot Design and Fabrication (CREATE) Lab at EPFL, has joined NCCR Robotics as an associate member. Her research focuses on developing new fabrication and computational design tools for the development of robots with new capabilities, and to better understand the physical world. We welcome Josie to the team and look forward to her scientific contributions. Read more.

NCCR Robotics Grants for collaborative projects

The NCCR Robotics call for collaborative research attracted 6 very good proposals. As a result, 3 projects were selected for funding: "Wireless, actuating electronic skins for early prediction of mental and cognitive decline in Parkinson's disease (Blanke and Lacour); Sensory-motoR nEurostImulation to eNhance myosuit perFORmanCE (REINFORCE) (Raspopovic, Micera and Riener); Origami-Based Human-Robot-Interface for Stabilizing Deployable Miniature Robots for Minimal-Invasive Laser Surgery (Paik and Rauter). Read more.

#NCCRWomen campaign

#NCCRWomen
Women in Swiss Research

To celebrate Women's Day 2021 and the 50th anniversary of women's right to vote in Switzerland, NCCRs across the country are creating series of videos showcasing women working in science. The videos are targeted at women and girls of school and undergraduate age to show what day to day life as a scientist is like and make it more accessible. NCCR Robotics videos can be viewed here, and via the SNSF website.

Article in Frontiers in Neuroscience

frontiers in Neuroscience

The Marchal-Crespo lab has a new study accepted in *Frontiers in Neuroscience*, where they investigate the effect of body ownership and congruency of visuo-tactile information on motor performance in immersive virtual reality (i.e., participants felt a brush stroking their real fingers while seeing a virtual brush stroking the same vs different virtual fingers). The results suggest that it might be beneficial to provide congruent information in immersive virtual environments, especially during the training of motor tasks in neurorehabilitation interventions. Read more.

Online robotics seminars

NCCR Robotics is organising two series of online seminars for its members, one within the Wearable Robotics Grand Challenge, the other on Flying and Legged robots. The recordings of the talks can be found on two YouTube playlists here and here.

Articles in Science Advances and Nature Materials

The Raspopovic lab published one article featured on the cover of *Science Advances,* on the neuro-robotic mechanisms involved in human-machine interfaces and operations, in particular showing how users control the robotic device differently according to specific features

ROBOTICS WORLD

Top News

· To Fly a Drone in the U.S., You Now Must Pass FAA's TRUST Test
· A Clever Robot Spies on Creatures in the Ocean's 'Twilight Zone'
· Why Robots Can't Be Counted On to Find Survivors in the Florida Building Collapse

External calls

· IROS 2021 Workshop on Robotic Manipulation of Deformable Objects
· IEEE World Haptics Conference (WHC)

Start-up corner

Please find the following links related to start-up support. If you would like to promote your events through our channel, please contact us nccr-robotics@epfl.ch

· **Innosuisse Scale-up Coaching** is aimed at innovative and science-based start-ups with very high growth potential and is intended to give them a boost. The programme grants a voucher worth of up to CHF 75,000 for personalised coaching sessions and targeted networking over a period of a maximum of 24 months. The call is open from June 3 to July 23.

Equal Opportunities Corner

· The NCCR Women campaign continues.Launched on 8 March, the campaign will keep presenting profiles of women researchers working at Swiss institutions, thanks to the participation of all 22 NCCRs.
· These women innovators are overcoming the gender disparity in robotics. An article in "The Week" magazine about gender unbalances and pay disparities in India.
· STEM: Universities empowering women to infiltrate the discipline of the future. How UK

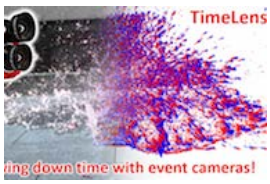
of the neural stimulation; and one review in *Nature Materials* that covers the various neurotechnological approaches that have been proposed for the development of the optimal sensory feedback restoration device for arm and leg amputees.

Swiss Robotics Master Award

The first call to the Swiss Robotics Masters Award was very successful! As a result, NCCR Robotics has awarded 8 excellent women with a certificate and a prize money to help them support their studies while attending a master program in Switzerland. Read more.

Slowing down time with event cameras

The Scaramuzza lab introduces TimeLens, a new event-based video frame interpolation method that generates high speed video from low framerate RGB frames and asynchronous events. An article describing the method has been accepted for publication at the IEEE Conference on Computer Vision and Pattern Recognition (CVPR), Nashville, 2021. Code, datasets and more can be found on the project page. Read more.



"Mars Mission" attracts more than 700 students

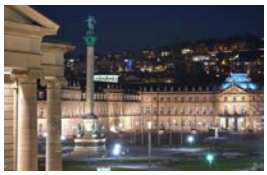
A total of 180 teams of students between the ages of 8 and 18, from all over the world, have signed on to the R2T2 Mars Mission, an educational project developed at EPFL for grade-school and high-school classes that use the Thymio robot. Read more.

Grassroots Projects

Three Grassroots projects were awarded as a result of the recent call for proposals. “Cellulo-Mori: Reconfigurable Modular Swarm Robots” is a collaboration between the Dillenbourg and Paik labs; ‘Sensible-exo’ brings together the Gassert and Raspopovic labs; ‘"Tricking the brain" to embody an extra limb: Third Arm Illusion in a self-touch protocol’ is a collaboration between the Marchal-Crespo and Micera labs. Read more

House of Switzerland in Stuttgart

Presence Switzerland organises a "Pop-up House of Switzerland" to stay for four months in the centre of Stuttgart. The programme includes "New Science of Robotics", an exhibition curated by EPFL Pavilions, with contributions from Auke Ijspeert, Jamie Paik, Selman Sakar and Herb Shea, and sessions on robotics such as one on exoskeletons on 15 July and one on the future of aerial robotics on 12 October. Read more.



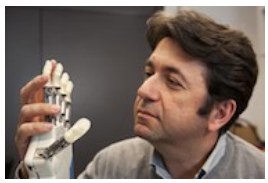
Omnigrasp wins EuroEAP challenge

Omnigrasp is a soft robotic gripper developed by the Shea and Floreano labs that uses electroadhesion on silicone fingers to deftly and securely grasp an enormous range of objects. It has won the EuroEAP Society Industry Challenge 2021, an annual open competition from the EuroEAP Society, that promotes the scientific and technological advancement of Electromechanically Active Polymers (EAP). Read more.

CONGRATULATIONS

EMBS Technical Achievement Award

Silvestro Micera has been awarded the 2021 EMBS Technical Achievement Award for his contribution to the development of new implantable neuroprostheses to restore sensory and motor function in disabled people. The award is given annually to individuals to “recognize outstanding achievements, contributions, and/or innovations in any area of bioengineering by an individual or group of individuals". Read more.



NCCR Robotics PIs listed in the AI 2000 Robotics Most Influential Scholars

Roland Siegwart was listed among the "Robot Most Influential Scholars" and Davide Scaramuzza and Marco Hutter have been presented with the "Robot Most Influential Scholars Honorable Mention". The 2021 AI 2000 Most Influential Scholars in Robotics are the top 10 most cited scholars from the top venues of this field over the past 10 years (2011–2020). The top 11–100 most cited scholars are recognized as AI 2000 Most Influential Scholars Honorable Mention. Read more

Best Paper Award

Giorgio Valsecchi, Ruben Grandia, and Marco Hutter have received the IEEE Robotics and Automation Letters Best Paper Award for their article "Quadrupedal Locomotion on Uneven Terrain With Sensorized Feet".

universities are acting to encourage more women to specialise in a STEM field.

External positions

· Professor of Robotics, Automation and Mechatronics at KU Leuven
· Three Post-Doc Positions in Surgical Robotics at the STORM Lab - Leeds, UK

NCCR Robotics

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Prof. Dario Floreano (EPFL)

Co-director
Prof. Robert Riener (ETH Zurich)

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NCCR ROBOTICS CALLS

Master Students Exchange Program

Every year, NCCR Robotics opens a call for awards for women master students who wish to spend a period of 3-6 months in an NCCR Robotics lab. The deadline for applications is 12 September, 2021. All details and the application procedure can be found here.

PhD/Postdoc Exchange Program

This call is dedicated to offer financial assistance to PhD students and Postdocs from both inside and outside our organization to take part in a 3-6 months collaborative project in a field related to the NCCR. The deadline for applications is 12 September, 2021. All details and the application procedure can be found here.

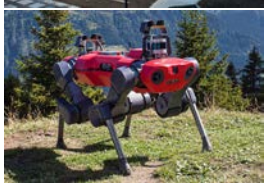
NCCR ROBOTICS OPEN POSITIONS

Two positions at LEARN

The Center for Learning Sciences (LEARN) at EPFL is looking for a Scientific Collaborator and for a Pedagogical Advisor to join a project about playful learning of management skills, supported by the LEGO Foundation. Details about the two positions can be found here and here.

DevOps Tech Lead at ANYbotics

The NCCR Robotics spin-off is looking for a DevOps Engineer to join the team and and implement cloud solutions to configure, operate, and monitor fleets of robots. Read more.



PRESS COVERAGE

H2020 and robotics

In an article about the current negotiations between Switzerland and the European Union on the Horizon Europe programme, Swissinfo has mentioned several examples of H2020 projects on robotics where NCCR Robotics researchers were involved. Read more

Bird-like drones in Technology.org

An article about bio-inspired aerial robots, including interviews with Enrico Ajanic and Dario Floreano about their raptor-inspired drone and other project of the Floreano lab. Read more

IEEE Video Friday

Davide Scaramuzza's talk at ICRA 2021 workshop on Opportunities and Challenges with Autonomous Racing was featured in IEEE Spectrum Video Friday. Read more.

Flyability at the 2021 SelectUSA Investment Summit

The drone-focussed website sUAS has a story reporting on how Flyability was recently invited to share best practices with foreign drone startups that want to work in the U.S. Read more.

Myosuit for physical training of heart failure patients

The German paper "Deutsches Herzzentrum Berlin" featured an article on the Myosuit study in collaboration with the SMS Lab, for physical training of heart failure patients, including an explanatory video. Read more (in German)

Alexandre Alahi's interview in SwissInfo

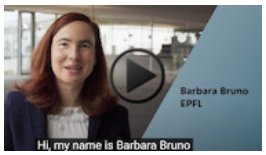
The NCCR Robotics associate PI, who leads the Visual Intelligence for Transportation (VITA) at EPFL, was interviewed for the SwissInfo newsletter on AI, robotics and digital technology, where he discussed future mobility and autonomous vehicles. Read more

More press coverage available through NCCR Robotics website.

NEW VIDEOS

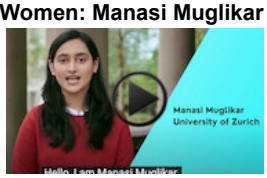
NCCRWomen: Barbara Bruno

NCCRWomen: Marie Georgarakis



NCCRWomen: Karin Buetler

NCCRWomen: Manasi Muglikar



NEW MEMBERS

Adrian Esser (Riener lab)

Adrian Esser received his Bachelor's Degree in Engineering Science from the University of Toronto in 2017. He then pursued a Masters in Robotics, Systems, and Control at ETHZ, developing a controller for an exoskeleton such that motion of the upper arm would be co-ordinated with the shoulder joint in a physiologically meaningful way. In April of 2021 he joined the SMS lab as a PhD student. Adrian's research focuses on upper extremity biomechanics and textile-based assistive robotic devices. When not working Adrian can almost certainly be found either tinkering with something or outdoors.

DEPARTING MEMBERS

Antonio Loquercio (Scaramuzza lab)

Antonio Loquercio has successfully defended his PhD dissertation titled "Agile Autonomy: Learning Tightly-Coupled Perception-Action for High-Speed Quadrotor Flight in the Wild" on May 10, 2021 with reviewers Prof. Pieter Abbeel, Prof. Angela Schoellig and Prof. Roland Siegwart.

SELECTED NCCR ROBOTICS PUBLICATIONS *

L. Bauersfeld*, E. Kaufmann*, P. Foehn, S. Sun, D. Scaramuzza, "NeuroBEM: Hybrid Aerodynamic Quadrotor Model", Robotics: Science and Systems (RSS), 2021.

G. Valle, A. Saliji, E. Fogle, A. Cimolato, F. M. Petrini, S. Raspopovic. Mechanisms of neuro-robotic prosthesis operation in leg amputees. Science Advances, vol. 7(17), eabd8354, 2021.

S. Raspopovic, G. Valle, F. M. Petrini. Sensory feedback for limb prostheses in amputees. Nature Materials, 2021.

E. Soria, F. Schiano, D. Floreano. Predictive control of aerial swarms in cluttered environments. Nature Machine Intelligence, 2021.

G. Abbate, B. Gromov, L. Gambardella, A. Giusti. Pointing at Moving Robots: Detecting Events from Wrist IMU. ICRA 2021.

L. El-Hamamsy, B. Bruno, F. Chessel-Lazzarotto, M. Chevalier, D. Roy, J. D. Zufferey, F. Mondada. The symbiotic relationship between educational robotics and computer science in formal education. Education and Information Technologies, 2021.

D. Gehrig, M. Rüegg, M. Gehrig, J. Hidalgo Carrio, D. Scaramuzza. Combining Events and Frames using Recurrent Asynchronous Multimodal Networks for Monocular Depth Prediction. IEEE Robotics and Automation Letters, vol. 6(22), pp 1-8.

M. Xiloyannis, R. Alicea, A.-M. Georgarakis, F. L. Haufe, P. Wolf, L. Masia and R. Riener. Soft robotic suits: State of the art, core technologies and open challenges, IEEE Transaction on Robotics, (in press).

D. Palossi, N. Zimmerman, A. Burrello, F. Conti, H. Müller, L. M. Gambardella, L. Benini, A. Giusti, J. Guzzi. Fully Onboard AI-powered Human-Drone Pose Estimation on Ultra-low Power Autonomous Flying Nano-UAV (submitted to IEEE)

* Selected publications include those that have been notified to the editor. All members are kindly encouraged to inform the management team of new publications. Read all publications.

The Swiss National Centre of Competence in Robotics (NCCR Robotics) is a federally funded programme bringing together robotics laboratories from EPFL, ETH Zurich, University of Zurich, IDSIA, UNIBE, EMPA, University of Basel to work on wearable, rescue and educational robots.

The National Centres of Competence in Research are a research instrument of the Swiss National Science Foundation.