

COMMUNITY NEWSLETTER

LATEST NCCR NEWS

Amazon Research Award

Margarita Chli from ETH Zurich is among the recipients of the 2020 Amazon Research Awards, a program that provides unrestricted funds and AWS Promotional Credits to academic researchers investigating research topics across a number of disciplines. The 101 recipients represent 59 universities in 13 countries and were announced on 27 April. [Read more](#).



Collaboration with NASA

Davide Scaramuzza's lab is collaborating with NASA/JPL to investigate the use of event cameras for the next Mars helicopter missions. The Ingenuity helicopter, brought on the Red Planet by the Perseverance mission, is demonstrating the potential of flying robots for planetary exploration, and event-based cameras promise to broaden the operational capabilities of future missions. [Read more \(interview on SwissInfo\)](#).



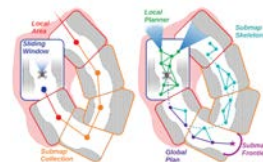
First event camera in orbit

Delbruck lab's DAVIS240 Dynamic and Active Pixel Vision Sensor event camera is the first neuromorphic device ever launched to space. It was included in the custom payload as part of the UNSW Canberra Space's M2 CubeSat satellite, launched from New Zealand on 23 March 2021. The mission brings together emerging technologies that deliver advanced capabilities in Earth observation, maritime surveillance, and satellite communications. A [paper](#) describing the sensor, with then-NCCR member Christian Brandli as first author, received the Honorable Mention Award at the 2014 NCCR Robotics PhD Paper Award. [Read more](#).



GLocal

The Siegwart lab introduces GLocal, a modular system for efficient Global and Local exploration planning and mapping in large scale environments, accounting for past pose corrections due to state estimation drift. In a submap-based approach, multiple layers of both mapping and planning are combined to achieve robustness to drift while maintaining efficiency in large scale environments. The [paper](#) and [code](#) are available.



Special issue on soft sensors and actuators

Jamie Paik co-edited a special issue of "Advanced Intelligent Systems" devoted to soft bionic sensors and actuators, together with Woo Soo Kim from the Simon Fraser University in British Columbia. The collection includes interdisciplinary research combining materials science, physics, mechanical engineering, electrical engineering, biomedical engineering, and more. [Read the guest editorial here](#).



New Myosuit trial

The Riener Lab, together with MyoSwiss AG, has started a collaboration with the Don Carlo Gnocchi Foundation, a non-profit, private network of 28 centers distributed in 9 regions in Italy, with a strong focus on validation of new technologies for rehabilitation. The partners will conduct a clinical study to assess the therapeutic effects of Myosuit-assisted training on a population of chronic stroke patients.



Pointing at Moving Robots

The Gambardella lab has a newly-accepted paper for ICRA 2021, titled "Pointing at Moving Robots: Detecting Pointing Events from Wrist IMU" by G. Abbate, B. Gromov, L. Gambardella, A. Giusti. It proposes a practical approach for detecting the event that a human wearing an IMU-equipped bracelet points at a moving robot; the approach uses a learned classifier to verify if the robot motion matches the wrist motion. The approach is implemented in a real-world demonstrator that allows users to land quadrotors by pointing at them. Watch the [video](#).



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ROBOTICS WORLD

Top News

- [Robotics funds hit by massive outflows in March](#)
- [Robot taught table etiquette can explain why it won't follow the rules](#)
- [Brain Signals Can Drive Exoskeleton Parts Better With Therapy](#)

External calls

- [ICRA 2021 Workshop on Teleoperation of Dynamic Legged Robots in Real Scenarios \(deadline: 1 May\)](#)
- [IEEE International Symposium on Safety, Security, and Rescue Robotics \(deadline: 15 June\)](#)

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

- [Hannover Messe](#). NCCR Robotics participated in the 2021 Digital Edition (12-16 April 2021) as a member of the [Swiss Pavilion](#), championing NCCR Robotics spin-offs and startups from the robotics ecosystem. Our [featured products](#) included Bota Systems, Dronistics, Project Play, SUIND, Omnigrasp and AICA. The show had over 90,000 attendants.
- [Innosuisse Bridge Proof of Concept](#): a grant for young researchers to transform research findings into marketable products. Deadline: 7 June 2021.
- [Business creation ICT courses](#): online modules available from May 2021 onwards.

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,

Paper at ICRA 2021

The article "Autonomous Overtaking in Gran Turismo Sport Using Curriculum Reinforcement Learning", by the Scaramuzza lab, has been accepted at the International Conference on Robotics and Automation and is available online. It describes a new learning-based method to tackle the autonomous overtaking problem, evaluated in the popular car racing game Gran Turismo Sport. [Read more.](#)



Swiss Robotics Masters Award

NCCR Robotics has established a Swiss Robotics Masters Award open to outstanding and highly motivated female students who wish to pursue a Master program with a strong robotics component in one of Switzerland's higher education institutions. The program consists of two types of Awards: A) CHF 5,000 grant per semester for the whole duration of the master program (up to a maximum of 4 semesters) – two grants available. B) CHF 2,000 single award to support participation in a master program – 6 grants available. [Read more.](#)



ARCHE 2021

The 2021 edition of ARCHE (Advanced Robotic Capabilities for Hazardous Environment) will take place in July in Wangen An der Aare. Robots for deployment in disaster relief will be tested in various environments and conditions such as floods and earthquakes. A public day (invite-only) with presentations in the morning and demonstration & exhibition in the afternoon will allow interactions with potential end-users from the technologies developed within the NCCR Robotics Rescue Robotics Grand Challenge.



NCCR Robotics seminars

NCCR Robotics is launching today its Seminar Series on Flying and Legged Robots. The series will showcase presentations from different NCCR Robotics researchers and will take place between May and September 2021. See [full list on NCCR Website.](#)



Ascent of robots

The movie «The ascent of the robots», which has been produced by Leon Riener in collaboration with ETH Zurich and the RSL and SMS Labs, has been nominated for the SCINEMA International Science Film Festival 2021 in Adelaide, Australia. The SCINEMA is the largest Science Film Festival in the Southern Hemisphere.



Nature of Robotics

The exhibition "Nature of Robotics" will continue at EPFL Pavilions until 16 May. Through artists' works and scientific productions from EPFL laboratories, it invites contemporary reflection on the place of artificial agents in our natural and social ecosystems. Visions emerging from the laboratories are juxtaposed with speculative creatures, drawings, diagrams, and videos produced by contemporary artists. [Read more.](#)



CONGRATULATIONS

PhD thesis

Alexander Millane (Siegwart's Lab) has successfully defended his PhD dissertation titled "Scalable Dense Mapping Using Signed Distance Function Submaps". He has focused on 3D map-building for rotary-wing UAVs, and more generally on map representations for mapping large-scale environments on computationally constrained platforms.



ERF Technology Transfer Award

The Riener Lab and MyoSwiss placed 2nd at the euRobotics Technology Transfer Award, held as part of the European Robotics Forum 2021. The Award was given for the group's work on the Myosuit, a lightweight wearable robot for the lower limbs that assists people with muscular weakness during physical therapy and in daily life. [Read more.](#)



Career Development Award

Two more Career Development Awards have been assigned to Xin Peng and Fatemeh Farsijani, who will both be visiting NCCR labs during 2021. Xin Peng is a PhD student in the Mobile Perception Lab at ShanghaiTech University, China and will spend 6 months with Davide Scaramuzza at UZH. Fatemeh Farsijani is a Master student at EPFL with Selman Sakar and was offered a place in Bradley Nelson's lab at ETHZ to work on her master project.



thanks to the participation of all 22 NCCRs. NCCR Robotics will share its stories on the week of 17-21 May 2021.

· NCCR Robotics has launched an online Implicit Bias Module to sensitize its community to bias, both in the workplace and during recruitment processes. The modules will be followed by a round table discussion in June on the topic.

External positions

- Post-doc in analysis and control of lower limb exoskeletons, IIT, Italy.
- Professor in Systems Engineering, Queen Mary University of London.

NCCR Robotics

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Prof. Robert Riener (ETH Zurich)

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Workshop on Perception and Action in Dynamic Environments at ICRA 2021

The Scaramuzza lab organizes a workshop on perception and action dynamic environments that will bring together top keynote speakers and will include a competition on drone navigation in a forest. Check out the [website](#) for more info and the current list of invited speakers and the call for papers (deadline: 10 May 2021).

NCCR ROBOTICS OPEN POSITIONS

Positions at ANYbotics

The NCCR Robotics spin-off is looking for several figures, including Design-to-Cost engineer, DevOps Engineer, Navigation Software engineer, Product Manager. [Read more](#).



Postdoc on AI devices at EPFL

EPFL is looking for a Postdoc researcher on "Edge AI Devices for DigiPredict, Exosome and Beyond", to work in collaboration with 3 different labs (including David Atienza's) on a program co-funded by the EPFL Center for Intelligent Systems (CIS). [Read more](#).

PRESS COVERAGE

ANYmal in a chemical plant

The use of the ANYBotics robot in inspecting a BASF site in Germany was featured in *L'Usine Digitale* (in French). [Read more](#)



Sevensense profile

The NCCR Robotics spinoff was profiled in the Robotics Business Review, including a description of its management, products and business model. [Read more](#).



Ethics in robotics

Swissinfo and NCCR Robotics collaborate on a periodical newsletter about AI and robotics, where our researchers are interviewed regularly. In the latest issue, Aude Billard discussed ethical issues in robotics. [Read more](#)



Educational robots in SwissInfo

In early March, SwissInfo took stock of the application of robots in Swiss classrooms, in a [long article](#) that includes an interview with Francesco Mondada. The same month, educational robotics was also discussed in the newsletter that SwissInfo dedicates to AI and robotics, this time with [Barbara Bruno](#) from the Dillebourg lab interviewed.



Drones on "Video Friday"

The drones from the Scaramuzza lab were featured in IEEE Spectrum's weekly review of the best robot videos in March, with the [Dodge Drone Challenge](#), where participants have to code navigation policies to fly drones between waypoints while avoiding dynamic obstacles. [Read more](#)

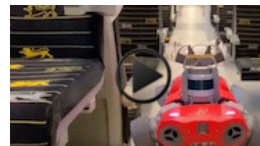


NEW VIDEOS

Autonomous Overtaking in Gran Turismo Sport Using Curriculum Reinforcement Learning



Robotic Inspection in Train Maintenance with ANYMal



NEW MEMBERS

Daniel Carneto Tozadore

Daniel joined EPFL as a postdoc in the [Mondada](#) and [Dillenbourg](#) Labs for the Educational Grand Challenge of the NCCR Robotics in April

2021. Daniel is a postdoc working on the development and testing of robots and algorithms for education. Having acquired expertise on Human-Robot Interaction and Artificial Intelligence on Education, he now investigates the impact of the robot, and of the Learner-Robot Interaction, on the learning process as well as methodologies to engage teachers and students in cooperative tasks through robotics.



Mustafa Mete (Paik lab)

Mustafa is a Ph.D. student working on design, modeling, and control of origami-inspired robots. His research focuses on the model-based design and control of foldable robots with onboard sensors driven by soft pneumatic actuators.



DEPARTING MEMBERS

Florian L. Haufe (Riener lab)

Florian L. Haufe, who successfully defended his PhD thesis in October 2020, will leave his position as an NCCR research assistant on April 1st, and transition full-time to work on the NCCR-funded Spinoff Project Play, hosted by the SMS Lab.



SELECTED NCCR ROBOTICS PUBLICATIONS *

G. Di Biase, H. Blum, R. Siegwart, and C. Cadena. "Pixel-wise Anomaly Detection in Complex Driving Scenes". International Conference on Computer Vision and Pattern Recognition (CVPR). Arxiv Preprint, 2021.

F. Fuchs, Y. Song, E. Kaufmann, D. Scaramuzza, P. Duerr, Super-Human Performance in Gran Turismo Sport Using Deep Reinforcement Learning, IEEE Robotics and Automation Letters (RA-L), 2021.

M. Gehrig, W. Aarents, D. Gehrig, D. Scaramuzza, DSEC: A Stereo Event Camera Dataset for Driving Scenarios, IEEE Robotics and Automation Letters (RA-L), 2021.

A. Loquercio, A. Saviolo, D. Scaramuzza, AutoTune: Controller Tuning for High-Speed Flight. Arxiv Preprint, 2021.

A. Millane, H. Oleynikova, C. Lanegger, J. Delmerico, J. Nieto, R. Siegwart, M. Pollefeys, and C. Cadena. "Freetures: Localization in Signed Distance Function Maps". IEEE Robotics and Automation Letters, 2021.

M. Muglikar, M. Gehrig, D. Gehrig, D. Scaramuzza, "How to Calibrate Your Event Camera", IEEE Conference on Computer Vision and Pattern Recognition Workshop, 2021.

M. Pantic, L. Ott, C. Cadena, R. Siegwart, and J. Nieto. "Mesh Manifold based Riemannian Motion Planning for Omnidirectional Micro Aerial Vehicles" IEEE Robotics and Automation Letters 2021

C. Pfeiffer, D. Scaramuzza, Human-Piloted Drone Racing: Visual Processing and Control, IEEE Robotics and Automation Letters (RA-L), 2021.

L. Schmid, V. Reijgwart, L. Ott, J. Nieto, R. Siegwart, and C. Cadena, "A Unified Approach for Autonomous Volumetric Exploration of Large Scale Environments under Severe Odometry Drift", IEEE Robotics and Automation Letters (2021).

Y. Song, H. Lin, E. Kaufmann, P. Dueer, D. Scaramuzza, "Autonomous Overtaking in Gran Turismo Sport Using Curriculum Reinforcement Learning", International Conference on Robotics and Automation (ICRA), 2021.

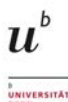
Y. Song, M. Steinweg, E. Kaufmann, D. Scaramuzza, Autonomous Drone Racing with Deep Reinforcement Learning. arXiv Preprint, 2021.

* 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.](#)

NCCR Robotics



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.

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