

COMMUNITY NEWSLETTER

LATEST NCCR NEWS

Swiss Robotics Day in Zurich

The vitality and richness of Switzerland's robotics scene was on full display at the 2021 Swiss Robotics Day, that took place on 2 November in Zurich. It was the first edition of NCCR Robotics's flagship event after the pandemic, and it surpassed the scale of previous editions, drawing in almost 500 people. [Read more.](#)



CERBERUS team won the Darpa Challenge

The CERBERUS (CollaborativE walking & flying RoBots for autonomous ExploRation in Underground Settings) team has won the Systems Competition in the Final Event of the DARPA Subterranean (SubT) Challenge. The team, which includes two NCCR Robotics labs (Roland Siegwart's and Marco Hutter's at ETH Zurich) and our spin-off Flyability, has prevailed among the 8 teams involved in the competition held in Louisville, Kentucky, and received the \$ 2 million first place prize. [Read more.](#)



High-speed flight in the wild

The Scaramuzza lab published an article in *Science Robotics* in October, in collaboration with Intel. The study describes an end-to-end policy trained in simulation that can be used to fly vision-based drones in the wild at up to 40 km/h. In contrast to classic methods, the approach uses a CNN to directly map images to collision-free trajectories. This approach radically reduces latency and sensitivity to sensor noise, enabling high-speed flight. A video is available on [youtube](#), as well as the [code and datasets](#) on github.



IEEE-RAL article

Enrica Soria (Floreano's lab) published an article on [Distributed Predictive Drone Swarms in Cluttered Environments](#) in *IEEE Robotics and Automation Letters* in October. The article is a follow-up to the [study](#) that made the cover of *Nature Machine Intelligence* in May, and describes a distributed predictive swarm model that generates self-organized, safe, and cohesive trajectories by solving an optimization problem in real-time. [Read more.](#)



Article in Science Robotics

Grégoire Courtine's lab contributed to a publication describing how human-robot interaction factors influence the quality of gait patterns during neurorehabilitation. The study found that with a highly transparent device and a conventional harness, healthy participants select a small backward force when asked for optimal BWS conditions. This unexpected finding challenges the view that during human-robot interactions, humans predominantly optimize energy efficiency. Instead, they might seek to increase their feeling of stability and safety. [Read more.](#)



Master students get their degrees

The second cohort of Robotics Master Students from EPFL graduated on 2 October, comprising 72 students. A full [photo gallery](#) from the day is available on the EPFL Media Library.



CYBATHLON 2024

Announced at the Swiss Robotics Day, the third edition of the CYBATHLON will take place from 25 to 27 October 2024 in a global format in the Arena Schluefweg in Kloten near Zurich and in local hubs all around the world. 160 international teams from the worlds of academia and industry will compete in a unique competition. Two more



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ROBOTICS WORLD

Top News

- Autonomous boats seem more solvable than autonomous cars
- Meta's touch-sensitive robotic skin could form part of the metaverse
- Giving robots social skills

External calls

- Swarm Intelligence call for Papers: Cross-disciplinary approaches for designing intelligent swarms of drones
- Eurohaptics 2022

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

- **Innolink.** The new application platform to submit and manage applications for innovation projects at Innosuisse is active since 25 October.
- **Innosuisse training on business creation for advanced engineering.** Modules available from February to August 2022 in Lausanne, Zurich and Bern.

Equal Opportunities Corner

- **Can Feminist Robots Challenge our Biases?** A guest post on IEEE Spectrum by Katie Winkle, from the KTH Royal Institute of Technology, Stockholm, on whether robots that don't put up with inappropriate behavior may help bridge engineering's gender divide

External positions

- ERA Chair in Artificial Intelligence for Robotics - University of Zagreb
- Postdoc position in neuromorphic vision for drones - TU Delft
- Tenure-track positions at Rutgers

disciplines are added to the original six: a race using smart visual assistive technologies and a race using assistive robots. [Read more.](#)

Hilti SLAM challenge

The Scaramuzza lab released the [Hilti SLAM Challenge Dataset](#). The sensor platform used to collect this dataset contains a number of visual, lidar and inertial sensors which have all been rigorously calibrated. All data is temporally aligned to support precise multi-sensor fusion. Each dataset includes accurate ground truth to allow direct testing of SLAM results. Raw data as well as intrinsic and extrinsic sensor calibration data from twelve datasets in various environments is provided. Each environment represents common scenarios found in building construction sites in various stages of completion. Read the [paper](#) for more details.



Article in advanced intelligent systems

The Floreano lab has a new paper accepted in the journal, called "Passive Perching with Energy Storage for Winged Aerial Robots". The study shows the fastest UAV perching to date by employing a claw on the front of a fixed-wing UAV. The UAV avoids complicated and dangerous perching maneuvers and simply flies straight into poles, rods, cables, etc. The UAV isn't damaged when doing this because the claw can absorb and store kinetic energy at impact. Once perched, the UAV holds on by the claw.



CONGRATULATIONS

Associate professorship

Marco Hutter, previously Tenure-Track Assistant Professor, was appointed Associate Professor of Robotic Systems in the Department of Mechanical and Process Engineering at ETH Zurich in September. [Read more.](#)



Extreme Tech Challenge Award

Fotokite won the 2021 Extreme Tech Challenge (XTC) Award, in the category "Smart Cities". The XTC is the world's largest ecosystem and competition for purpose-driven technology inspired by the United Nations 17 Sustainable Development Goals (SDGs). [Read more.](#)



TOP 25 scale-ups

The NCCR Robotics spin-off Flyability was selected among the 25 companies aged from 5 to 10 years with the greatest potential for growth, selected by TOP100 Swiss Startups Magazine. [Read more.](#)



NCCR ROBOTICS OPEN POSITIONS

PhD in Printed Wearable Haptics

Hebert Shea's lab at EPFL invites applications for a PhD student on additively manufactured wearable haptics based on soft actuators. The goal is to develop haptic gloves enabling unprecedented realism for AR and VR applications. Details about the position can be found [here](#).



Three positions at UZH

The Scaramuzza lab at the University of Zurich has three fully-funded openings for PhD students and Postdocs in computer vision and machine learning, to contribute to the areas of Vision-based agile flight, Autonomous inspection of power lines, SLAM, Scene Understanding, and Computational Photography with Event Cameras. Details about the three positions can be found [here](#).



Engineer positions at ANYbotics

The NCCR Robotics spin-off is looking for a Electrical Engineers, a Field Robotics Engineer and a Software System Developer, among other positions. [Read more.](#)



NCCR Robotics

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Postdoc and PhD opportunities at EPFL

Floreano's lab has two openings - one for a postdoctoral fellowship in aerial robotics (topics of interest include avian-inspired drones and multi-modal locomotion) and one for a PhD fellowship in Vision and Learning of Avian-inspired drones, for which it welcomes applications from Master students. All details [here](#).



PRESS COVERAGE

Swiss Robotics Day coverage

The 2 November event in Zurich was extensively covered by Swiss media, including [SRF](#), [Bilan](#) and [AGEFI](#). A summary of coverage can be found on the event's website. [Read more](#)



The impact of automation on the workplace

Aude Billard was interviewed by Heidi News on the occupational effects of AI and automation technologies. [Read more \(in French\)](#).



The future of aerial robotics

Dario Floreano and Davide Scaramuzza took part in an event organised on 12 October by the House of Switzerland in Stuttgart, discussing the future of drones. A [recording](#) of the discussion is available online.



Margarita Chli interviewed by Swissinfo

The leader of the [Vision for Robotics lab](#) at ETH Zurich talked to Swissinfo's Sara Ibrahim for an extended interview about her research work and on the problem of gender balance in engineering. [Read more](#).



Drone documentary

In an interview from the Swiss Italian TV LA1, Scaramuzza's group explains their work on drone racing and high-speed navigation, and why high-speed drones could make a difference in the future of search and rescue operations. [In Italian with English subtitles](#).

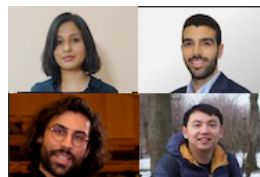


More [press coverage](#) available through [NCCR Robotics website](#).

NEW MEMBERS

Welcome to four new members

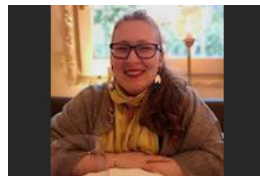
Four new members joined NCCR in the last months, to work on the new Grassroots and Collaborative projects. Pictured clockwise from top left: Astha Gupta (Ijspeert's lab); Emilio Fernandez-Lavado (Lacour's lab); Selim Habiby (also at Lacour's lab as a Postdoc); Yi-Shiun Wu (Dillenbourg's lab).



DEPARTING MEMBERS

Arzu Güneysu Özgür (Dillenbourg lab)

Arzu Güneysu Özgür has successfully defended her PhD thesis entitled "Designing Gamified Activities with Haptic-Enabled Tangible Robots for Therapy and Assistance" on September 28. In October 2021 she has joined the Royal Institute of Technology in Stockholm (KTH) as a researcher with Digital Futures Postdoc Fellowship.



Vivek Ramachandran (Floreano lab)

Vivek has successfully defended his PhD thesis entitled "Wearable Haptic Interfaces for Telerobotics" on 28 October. During his time at the LIS lab, his work focused on the development and testing of fabric-based wearable haptic interfaces that would allow humans to communicate, control, and learn to work with robots.



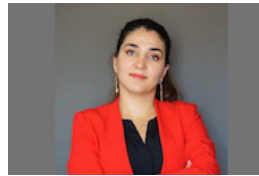
Bastien Orset (Blanke lab)

At Olaf Blanke's lab, Bastien Orset has successfully defended his PhD thesis entitled "Motor state transitions and Breathing in Brain Machine Interfaces" at the end of June, and has then moved to HUMA as a data scientist.



Elmira Yadollahi (Dillenbourg lab)

Elmira Yadollahi has successfully defended her PhD thesis entitled "Exploring Spatial Perspective Taking in Human-Robot Interaction" on October 19, and will be joining the Division of Robotics, Perception and Learning at Royal Institute of Technology in Stockholm (KTH), Sweden, as a postdoc in November 2021.



Anna-Maria Georgarakis (Riener lab)

On 2 September, Anna-Maria has successfully defended her PhD thesis entitled "Stability and mobility: Textile assistance for the shoulder for everyday life". She had joined Robert Riener's SMS lab in November 2016 as a PhD student, focusing on upper extremity biomechanics, physiology and assistive devices.



NEW VIDEOS

Distributed predictive drone swarms in cluttered environments



ANYmal meets Monkeys in the Wild of South Africa



SELECTED NCCR ROBOTICS PUBLICATIONS *

L. Bauersfeld, D. Scaramuzza, "Range, Endurance, and Optimal Speed Estimates for Multicopters", Arxiv Preprint, 2021

M. Helmberger, K. Morin, N. Kumar, D. Wang, Y. Yue, G. Cioffi, D. Scaramuzza, "The Hilti SLAM Challenge Dataset", Arxiv Preprint, 2021

A. Loquercio, E. Kaufmann*, R. Ranftl, M. Müller, V. Koltun, D. Scaramuzza, "Learning High-Speed Flight in the Wild", Science Robotics, 2021.

M. Mete and J. Paik, "Closed-Loop Position Control of a Self-Sensing 3-DoF Origami Module With Pneumatic Actuators," IEEE Robotics and Automation Letters, 2021.

Plooij M, Apte S, Keller U, Baines P, Sterke B, Asboth L, Courtine G, von Zitzewitz J, Vallery H. "Neglected physical human-robot interaction may explain variable outcomes in gait neurorehabilitation research", Science Robotics, 2021.

C. Pfeiffer, D. Scaramuzza, "Expertise Affects Drone Racing Performance", Arxiv Preprint, 2021

E. Soria, F. Schiano and D. Floreano, "Distributed Predictive Drone Swarms in Cluttered Environments," IEEE Robotics and Automation Letters, 2022.

* 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.



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