

COMMUNITY NEWSLETTER

LATEST NCCR NEWS

Women in science

On 8 March, this year's edition of the International Women's Day will focus on the topic of [women in leadership](#). For the occasion, EPFL will organise a [full-day online event](#) accessible without registration. The homepage of ETH Zurich on 8 March will feature stories, portraits and infos about and for women (see "Equal Opportunities Corner" on the right column for details). A few days before, on 5 March, a campaign involving all 22 NCCRs will be launched, based on videos that will portray female PhD students, postdocs and professors from all scientific disciplines. [NCCR Microbiomes](#) will start the campaign on Monday 8 March, and NCCR Robotics will participate by publishing videos in the second half of May. At NCCR Robotics, we will also soon start a series of online training modules to raise awareness among our members about gender bias in the research community.

Nature article

A team of Swiss and Canadian scientists, led by Grégoire Courtine at EPFL, have developed a treatment that allows patients to regain control of their blood pressure, using targeted electrical spinal-cord stimulation. No medication is required. The findings were published in late January in *Nature*. [Read more](#)

Drones keep flying without one rotor

The Scaramuzza lab published an article in *IEEE-R-AL* in January, demonstrating a method for keeping quadrotors flying in case of failure of one of their rotors. The method uses input from onboard sensors, in particular standard and event cameras. [Read more](#)

Myosuit clinical trial

The Riener Lab has started a clinical study, together with the Deutsches Herzzentrum Berlin (DHZB) and Charité Hospital, to use the Myosuit to support physical training of patients with cardiac insufficiency. The study is led by Prof. Riener and Prof. Dr. Volkmann Falk, director of the DHZB Department of Cardiothoracic and Vascular Surgery, and co-funded by the "ETHHeart initiative: emerging therapies for cardiovascular diseases".

PHASER

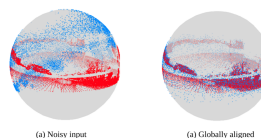
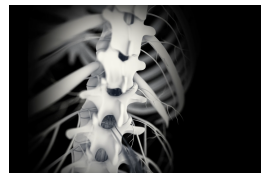
The article "PHASER: A Robust and Correspondence-Free Global Pointcloud Registration" by the Siegwart group has been published in *IEEE Robotics and Automation Letters*. The study introduces a correspondence-free global registration of sensor-centric pointclouds that is robust to noise, sparsity, and partial overlaps. [Read more](#)

Project Play

Florian Haufe and Michele Xiloyannis were awarded a Spin Fund Grant of CHF 100k for the commercialization of "Project Play". Project Play is a novel approach to movement therapy that connects the best of wearable robotics to the latest video games for an unprecedented training experience. The NCCR Spin Fund awardees are hosted at the Sensory-Motor Systems Lab, ETH Zurich, by Prof. Robert Riener.

CYBATHLON@school

Three workshops sponsored by NCCR Robotics and aimed at young students will be organised in the next months by [Mint & Pepper](#), the educational project by the Wyss Institute in Zurich. They are "Freizeitkurse Grüt", on 10 March 13:30-17:00, open to 50 girls and 50 boys in the year 6; "Startbahn 29" in Dübendorf on 6 May, for girls only; "Ferienplausch", Zürich Platform on 16 August for 50 girls and 50 boys, 11—12 years old. More details to follow soon on the [Mint & Pepper](#) website.



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- Congratulations: Best Paper Award, Matteo Macchini, Harvey Prize, PhD Thesis
- NCCR Robotics open positions: Floreano and Siegwart labs.
- NCCR Robotics calls
- Press coverage
- New videos
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ROBOTICS WORLD

Top News

- Virtual robot arms get smarter by training each other
- How NASA designed a helicopter to fly autonomously on Mars
- Soft legged robot with pneumatic circuitry

External calls

- Special Issue on "Robotics in Healthcare: Automation, Sensing and Application"
- RA-L Special Issue on Autonomous System in Robotic Surgery: Current Challenges in Design, Modeling, Perception, Control and Applications (deadline 28 February).

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

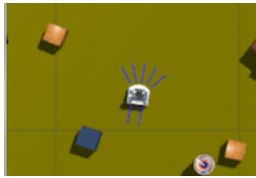
- NCCR Robotics is planning to be present at the Hannover Messe 12-16 April: spin-offs interested in presenting their projects can contact our Tech Transfer officer [Katuska Molina-Luna](#).
- Business growth training modules for Engineering start-ups: online modules available from March to June 2021.

Equal Opportunities Corner

- [International Women's Day at EPFL](#). A day of inspirational talks organized by EPFL on Monday 8th March 2021.
- [International Women's Day at ETH Zurich](#). A video-interview with Julia Dannath-Schuh, Vice president for Personnel Development and Leadership, will appear on the website on 8 March. An online event ("ETH Global Lecture Series: Towards Gender Equity: 8 March 2021") will discuss the parameters for closing the gender gap. Sarah Springmann will give a talk on "Women & Science". The Office for Equal

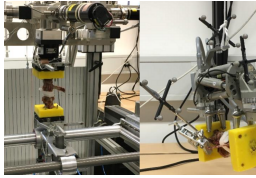
Paper in IEEE R-AL

The Gambardella lab published a new open-access article on "State-Consistency Loss for Learning Spatial Perception Tasks From Partial Labels" in IEEE Robotics and Automation Letters. The paper introduces a general approach to deal with the problem of having access only to partial labels when learning models for real-world robot spatial perception tasks, yielding significant quantitative performance improvements. [Read more.](#)



SpineBot project

The Rauter Lab at the University of Basel has been awarded the Christian Toggenburger Award 2021 for the "SpineBot Project", a programmable robotic device that performs intraoperative measurements of segmental stiffness of the spine in children with idiopathic scoliosis. The award corresponds to CHF 100,000 to develop a new and better version of the device and perform a feasibility study. [Read more.](#)



New financing round for Flyability

The NCCR Robotics spin-off, that specialises in indoor drone inspection for the industrial sector, has announced in December that it has raised EUR 7 million in a Series C funding round co-led by Future Industry Ventures and Swisscom Ventures. [Read more.](#)



Swiss-Korean science club

The Science and Technology Office of the Swiss Embassy in South Korea on 25 February organised an online Science Club on the topic of "Robotics Inspired by Nature", with Marco Hutter from ETH Zurich and Hae-Won Park from KAIST in Seoul (moderated by NCCR Robotics' science writer Nicola Nosengo). The recording of the event will soon be available on the S&T Office [Linkedin page](#) and [website](#).



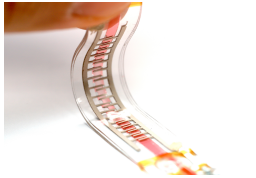
Article in Current Biology

In early January, Stanisa Raspopovic and his team published an article where they show that connecting the prostheses of leg amputees to the nervous system helps amputees to perceive the prosthesis weight as lower, which is beneficial for their acceptance. [Read more](#)



Special issue on soft robotic co-design

NCCR Robotics Director Dario Floreano co-edited a special issue of IEEE Robotics & Automation Magazine, on the design of a new generation of adaptive, compliant, and reliable soft robots. The introduction to the special issue can be found [here](#).



Newly accepted articles

The Scaramuzza lab had two new articles accepted in IEEE Robotics and Automation Letters. The first one is on a data-driven Model Predictive Controller for quadrotors. The [article](#) is already available, as well as the [video](#) and the [code](#). The second article is on combining events and frames using recurrent asynchronous multimodal networks. Here too, the [paper](#) is available online, as well as the [project page](#) and [code](#).



CONGRATULATIONS

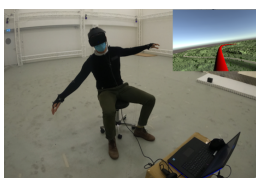
Best paper award

Marie Georgarakis (Riener lab) and Edoardo D'Anna (formerly at the Micera lab) won the 2020 NCCR Robotics Best Paper Award with their papers: A. Georgarakis et al., "Age-dependent asymmetry of wrist position sense is not influenced by stochastic tactile stimulation", published in *Frontiers in Human Neuroscience*; and E. D'Anna et al., "A closed-loop hand prosthesis with simultaneous intraneural tactile and position feedback" in *Science Robotics*.



Virtual reality paper

The article "The Impact of Virtual Reality and Viewpoints in Body Motion Based Drone Teleoperation", by Matteo Macchini from the Floreano lab, was accepted for the IEEE Conference on Virtual Reality and 3D User Interfaces (IEEE VR), which will take place online from 27 March to 3 April. The work focuses on Body-Machine Interfaces, Virtual Reality and first-person view perspectives to teleoperate robotic systems. The [article](#) is already accessible on arXiv.



Harvey Prize

In December 2020, Grégoire Courtine has been awarded the IET A F Harvey Engineering Research Prize – the most valuable prize given out by the Institution of Engineering and Technology (IET). Courtine will use

Opportunities and Diversity will screen [three films](#), followed by a Q&A session with Dr. Isabel Rohner, author and women's movement expert.

- [Women in Robotics Update: introducing the 2021 Board of Directors](#). Women in Robotics is a grassroots community involving women from across the globe.

External positions

- ERA Chair in artificial intelligence for robotics, University of Zagreb
- Multiple positions at National Robotarium, Heriot Watt University, UK

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the funding to further his research on spinal cord regeneration. [Read more.](#)



PhD Thesis

Titus Cieslewski (Scaramuzza lab) has successfully defended his PhD dissertation titled "Decentralized Multi-Agent Visual SLAM". Among his major contributions, a completely new approach to feature detection and matching, named IMPs, and a data representation showing that optimization is not needed for exploration.



NCCR ROBOTICS CALLS

Special issue on medical robotics

Science Robotics has opened a call for contributions for a special issue on medical robotics. The editorial board is looking for high-quality, original research articles that advance the field of medical robotics toward more intelligent, capable, autonomous systems. In particular, in vivo and first-use-in-human efforts, developments in brain-computer interfaces, as well as fundamental advances in micro- and nanorobotics. The journal is also looking for short "Focus" articles covering the ethical use of robots in medical applications and the use of robots against infectious diseases. Deadline: 3 May 2021. [Read more.](#)

Workshop on Event-based Vision

The Scaramuzza lab is co-organising the "3rd Workshop on Event-based Vision", which will take place in June at the IEEE Conference on Computer Vision and Pattern Recognition. The workshop is dedicated to event-based cameras, smart cameras, and algorithms processing data from these sensors. The paper submission deadline is March 27. [Read more here](#) for more info and the current list of invited speakers.

R2T2 Rendez-vous Mars mission

The educational R2T2 Rendezvous Mars remote and free missions for all teachers and their classes, based on the robot Thymio, are accepting registrations. The deadline is **5 March 2021**. The activity is for all students 10-18 years old. More information on [Twitter](#) and [LinkedIn](#). The latest edition of the [Roteco newsletter](#) for the robotics teachers' community is also online.

NCCR ROBOTICS OPEN POSITIONS

Positions at LIS - EPFL

The Floreano lab is advertising two new positions: 1) a postdoctoral fellowship to study learning and control of agile flight in avian-inspired drones. The project is carried out in collaboration with the laboratory of Prof. Davide Scaramuzza at University of Zurich. 2) a postdoctoral fellowship in learning and control of soft grippers, for a project carried out in collaboration with the laboratory of Prof. Herb Shea. [Read more about the positions.](#)



PhD positions at ETH

The Siegwart lab is looking for doctoral students to work on Full-body Control of an Interactive Aerial Robot and on Uncertainty Aware Mapping and Control for Aerial Robots. The positions are offered within the Marie Skłodowska-Curie Innovative Training Network (ITN) "Aerial RObotic TRAINing for the next generation of European infrastructure and asset maintenance technologies" (AERO-TRAIN; www.aerotraining.eu). The deadline for both applications is 6 March. See [here](#) and [here](#) for more details.



PRESS COVERAGE

Aude Billard in "The Brain"

The EPFL professor and NCCR Robotics member is among the scientists interviewed in the "*The Brain – Cinq nouvelles du cerveau*", a new Swiss documentary on neuroscience recently reviewed in *Le Temps*. [Read more](#)



Failure-resistant drones in IEEE spectrum

Scaramuzza's work on autonomous quadrotor flight despite rotor failure with onboard vision sensors is featured on IEEE Spectrum. [Read more](#)



Jamie Paik on ant-like robots

The EPFL professor was interviewed by *Freethink* in an article about swarming behavior in robots. The article starts by describing a recent *Science Robotics* publication on robotic fish, and then goes on to describe Paik's tribots. [Read more](#)



Thymio in classrooms

The robot designed by EPFL is being used in a new educational project in the Valais canton, described in an article in *Le Nouvelliste*. [Read more](#)



Le Temps on Courtine's research

The French-language newspaper had an article on the Nature publication, led by Grégoire Courtine, on blood-pressure regulation in patients with spinal cord lesions. [Read more](#)



ANYbotics in Le Temps

The Zurich-based ETH spin-off, and in particular its ANYmal robot, were the main subject of a story in Le Temps in December, focussed on main similarities and differences between the Swiss company and Boston Dynamics. [Read more](#)



UZH Space Hub

The University of Zurich has a You Tube channel entirely dedicated to its innovation cluster on "Space and Aviation". Among many interesting videos to check out, in December they featured an interview with Davide Scaramuzza on the development of autonomous drones. [See more.](#)



Robotics and Automation News

Siegwarts' lab at ETH Zurich, and in particular its research on machine learning applied to robotics, was featured in Robotics and Automation news in early January. [Read more](#)



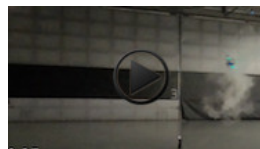
More [press coverage](#) available through *NCCR Robotics website*.

NEW VIDEOS

The ascent of robots



Data-Driven MPC for Quadrotors



NEW MEMBERS

Victor Guimera Borja (Dillenbourg lab)

Victor Guimera Borja joined the CHILI lab as a Robotics Engineer on February 1st. Victor is an engineer with a background in Mechatronics and Control, multidisciplinary and curious working with mobile robotics. His main duties consist in the redesign of Cellulo, mechanically, electronically and software-wise.



Chiara Basla (Riener lab)

Chiara joined the Riener Laboratory as a PhD student in January 2021 and she works on a lightweight wearable exosuit to provide assistance to patients with muscle weakness across activities of daily living.



Sihao Sun (Scaramuzza lab)

Sihao is a postdoctoral researcher working on the control problems for aerial vehicles. His work aims at improving aerial vehicle safety by leveraging fault-tolerant flight control, robust control, and machine learning.



D. Gehrig, M. Rüegg, M. Gehrig, J. Hidalgo-Carrió, D. Scaramuzza, "Combining Events and Frames using Recurrent Asynchronous Multimodal Networks for Monocular Depth Prediction", IEEE Robotics and Automation Letters (RA-L), 2021.

M. Nava, L. M. Gambardella and A. Giusti, "State-Consistency Loss for Learning Spatial Perception Tasks From Partial Labels", IEEE Robotics and Automation Letters, (2021).

J.W. Squair, M. Gautier, L. Mahe, et al. "Neuroprosthetic baroreflex controls haemodynamics after spinal cord injury". Nature (2021)

G. Torrente, E. Kaufmann, P. FoeHN, D. Scaramuzza, Data-Driven MPC for Quadrotors, IEEE Robotics and Automation Letters (RA-L), 2021.

J. Hidalgo-Carrio, D. Gehrig, D. Scaramuzza
Learning Monocular Dense Depth from Events, IEEE International Conference on 3D Vision (3DV), Fukuoka, 2020

F. Milano, A. Loquercio, A. Rosinol, D. Scaramuzza, L. Carlone
Primal-Dual Mesh Convolutional Neural Networks, Conference on Neural Information Processing Systems (NeurIPS), 2020

G. Preatoni, G. Valle, F. M. Petrini, S. Raspopovic,
Lightening the Perceived Prosthesis Weight with Neural Embodiment Promoted by Sensory Feedback, *Current Biology*, 2021.

S. Sun, G. Cioffi, C. de Visser, D. Scaramuzza
Autonomous Quadrotor Flight despite Rotor Failure with Onboard Vision Sensors: Frames vs. Events, *IEEE Robotics and Automation Letters (RA-L)*, 2021.

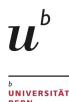
Z. Zhang, T. Sattler, D. Scaramuzza
Reference Pose Generation for Long-term Visual Localization via Learned Features and View Synthesis, *International Journal of Computer Vision (IJCV)*, 2020.

* 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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Images: Drone with rotor failure: University of Zurich; Myosuit: ETHZ/Myoswiss; Project Play: ETH Zurich; SpineBot: UniBasel; Thymio: EPFL.



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