

COMMUNITY NEWSLETTER

LATEST NCCR NEWS

RAS President Elect

Aude Billard will serve as RAS President Elect in 2022-2023. The RAS Administrative Committee elected Billard to serve as President Elect under President Frank Park & to assume the Society presidency in January 2023. [Read more.](#)



New implant offers promise for the paralyzed

A system developed by Grégoire Courtine and Jocelyne Bloch now enables patients with a complete spinal cord injury to stand, walk and even perform recreational activities like swimming, cycling and canoeing. The new system is described in an article appearing in Nature Medicine that was also co-authored by Silvestro Micera. [Read more.](#)



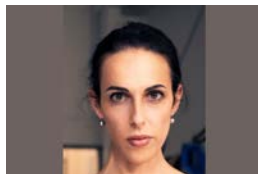
Associate Professor

The Basel University Council has appointed Georg Rauter as Associate Professor for Surgical Robotics in the Faculty of Medicine. Georg has been Assistant Professor for Medical Robotics and Mechatronics in the Department of Biomedical Engineering at the University of Basel since 2016. This assistant professorship has been financed by the Werner Siemens Foundation for five years as part of the MIRACLE project (Minimally Invasive Robot-Assisted Computer-Guided Laserosteotomy); now it has been made permanent. Rauter will take up his new position in the Department of Biomedical Engineering on 1 March 2022. [Read more.](#)



Welcome to Anna Valente

Anna Valente has joined NCCR Robotics as associate PI on 1 December. She is Head of the Laboratory for Automation, Robots and Machines at SUPSI. She got a Ph.D. in Manufacturing Technologies and Production Systems at Politecnico di Milano and a Post-doctorate in interoperability for adaptive factories from UBath, UK. She is the author of two books, several patents and more than 100 papers on system (re)configuration, robotics and control platforms. She is currently a member of the Swiss Science Council SSC. In 2019, she was awarded by the European Commission with the Woman-Led Innovation and the Grand Prix for Innovation. In 2021, she was awarded with the Swiss DINNO Award. [Read more.](#)



Welcome to Robert Katschmann

Year 12 brings another addition to the team with Robert Katschmann becoming an associate PI. Robert is an Assistant Professor of Robotics at ETH Zurich. He earned his Diplom-Ingenieur in 2013 from the Karlsruhe Institute of Technology (KIT) and his Ph.D. in Mechanical Engineering in 2018 from MIT in 2018. He worked on robotic manipulation technologies as Applied Scientist at Amazon Robotics and as CTO at Dexai Robotics. In July 2020, he founded the Soft Robotics Lab at ETH Zurich. His group develops soft robots whose compliant properties resemble living organisms and advances modeling, control,



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ROBOTICS WORLD

Top News

- [Competition Spurs Robotics and AI Innovations for Maritime Challenges](#)
- [Flying robot generates as much power as a flapping insect](#)
- [The Elusive Hunt for a Robot That Can Pick a Ripe Strawberry](#)

External calls

- [2022 International Conference on Unmanned Aircraft Systems](#)
- [Call for Contributions to EuroHaptics 2022](#)
- [Call for papers to ICRA 2022 workshop - Social Robot Navigation: Advances and Evaluation](#)

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 2022](#): NCCR Robotics will take part in the event, that takes place from 30 May to 2 June 2022.
- [Innosuisse training on business growth in engineering](#). Modules in Zurich from March to April.

Equal Opportunities Corner

· [Open Calls on Equal Opportunities](#)
We remind you that NCCR Robotics has open calls to promote women in robotics. The [award for Career Development](#) looks to support women that are pursuing a research career in robotics. The nature of the activities this award aims to support is flexible and focuses on female researcher empowerment in a broad sense. The [Women Keynote Speakers](#) funding program intends to support NCCR Robotics members who are organizing conferences in

and learning techniques tailored to the needs of soft robots. Robert is a member of the ETH AI Center, the Max Planck ETH Center for Learning Systems (CLS), and the ETH Competence Center for Materials and Processes (MaP). [Read more.](#)

Swiss Robotics Day 2022

The next edition of the Swiss Robotics Day will take place at the Beaulieu in Lausanne on 4 and 5 November 2022, and will mark the conclusion of NCCR Robotics. Companies interested in a booth or in becoming sponsors can contact us at nccr-robotics@epfl.ch. [Read more.](#)



NTN Innovation Booster Robotics workshop

The NTN IB Robotics is organizing an ideation workshop in Lugano on the 14th of April focusing on two topics: 1. Intuitive Programming and 2. Gripping Solutions for Robotics. The aim of this event is to give interested industry partners, faculty members and Swiss robotics stakeholders a very condensed and time-efficient opportunity to interact, and identify potential opportunities for collaborations that result in proof of concept proposals for potential funding from the NTN IB Robotics, powered by Innosuisse. Proposals as well as ideas generated during this workshop can be submitted to the 1st call for proposals closing on April 28th 2022. Prof. [Aude Billard](#) is leading the NTN booster in Robotics, for inquiries contact the NTN IB Robotics Managing Director katuska.molina-luna@epfl.ch. Registrations are open and spots are limited – [please register here.](#)



How to Swoop and Grasp Like a Bird

William Stewart from Floreano's lab published an article with the title "How to Swoop and Grasp Like a Bird With a Passive Claw for a High-Speed Grasping" in IEEE/ASME Transactions on Mechatronics. The article introduces a novel avian-inspired grasping claw that allows winged UAVs to grasp an object while flying over it. The high-speed, passively triggered claw can close in under half a second. Outdoor flight tests demonstrated that the 1 kg UAV can grasp an object in flight at 8 m/s, the fastest recorded grasping by a flying robot to date to best of our knowledge. [Read more.](#)



Articles on immersive virtual reality

The Marchal-Crespo lab has two new publications related to the work in the Third Arm project, as part of the Wearable Robotics Grand Challenge. The [first one](#) was published in "Frontiers in Human Neuroscience" and is about "Tricking the Brain" using immersive virtual reality. The second paper is currently being prepared for publication in "IEEE Transactions on Neural Systems and Rehabilitation Engineering", and describes how hiding assistive robots during training in immersive VR does not affect users' motivation, embodiment, performance. The abstract can be found [here](#).



New RAL papers

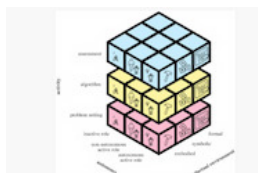
Davide Scaramuzza's lab has several newly-accepted papers in IEEE Robotics and Automation Letters. They deal with

- Continuous-Time vs. Discrete-Time Vision-based SLAM
- Nonlinear MPC for Quadrotor Fault-Tolerant Control
- Minimum-Time Quadrotor Waypoint Flight in Cluttered Environments
- Bridging the Gap between Events and Frames through Unsupervised Domain Adaptation
- AutoTune: Controller Tuning for High-speed Flight.



CT-Cube

A collaborative paper co-authored by Luca Gambardella and Francesco Mondada presents a framework for the design, realisation, analysis, and assessment of computational thinking activities, called CT-cube. The CT-cube allows to extend existing computational thinking models to consider the life-long development of computational thinking skills in individuals,



Switzerland to invite women speakers as keynotes.

· [Research in Switzerland hurt by gender gap and dispute with EU](#)

An article in SwissInfo about the challenges in increasing female participation in research in Switzerland

· [Support to Women Keynote Speakers](#)

As physical conferences and events resume, we remind you that NCCR Robotics has a programme to support members who organise conferences in Switzerland and wish to invite female speakers.

External positions

- Postdoc positions on mobile robotics at Aalborg University, Denmark
- Airbus - Industrial Robotics R&D Engineer
- Postdoctoral Fellow / Senior Scientist in the Environmental Robotics Lab at the Technical University of Munich
- Head of Robotics Drive Systems at Maxon

NCCR Robotics

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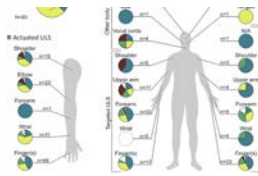
Design

Alternative Communication SA / Pascal Briod

from childhood to adult age, and to take into consideration the situated nature of computational thinking activities. [Read more.](#)

Article on intention detection

From the Gassert lab, a new publication in *Frontiers in Neurobotics* called "Intention Detection Strategies for Robotic Upper-Limb Orthoses: A Scoping Review Considering Usability, Daily Life Application, and User Evaluation", the paper presents a literature review to identify non-invasive IDS applied to ULO that have been evaluated with human participants, with a specific focus on evaluation methods and findings related to functionality and usability and their appropriateness for specific contexts of use in daily life. [Read more.](#)



Embodied intelligence workshop

Josie Hughes is in the programme committee of the Embodied Intelligence 2022 Conference, that will be held online from 23 to 25 March and will feature Auke Ijspeert and Marco Hutter among the speakers. The event is free, and includes plenary talks, panel discussions (including flash talks by leading researchers), and breakout sessions. [Read more.](#)



Thymio production in Lausanne

As part of the deployment of digital education, the Département de la formation, de la jeunesse et de la culture (DFJC) has signed a partnership with Mobsya, the non-profit association that produces the robot Thymio. The assembly and maintenance of these educational robots will now be entrusted to apprentice electronics technicians from the École technique - École des métiers de Lausanne (ETML). [Read more \(in French\).](#)



RoboSoft Workshop

Josie Hughes and Robert Katzschmann are co-organizers of this workshop in Edinburgh (hybrid format) on 4 April 2022, with the aim to introduce the already available soft robotics toolkits to the wider community and to inspire new approaches in developing such platforms for soft robots with the application and user experience in mind. [Read more.](#)



CONGRATULATIONS

TED Fellowship

Robert Katzschmann is part of the 2022 class of TED Fellows, comprising 20 innovators in various fields from 14 countries. The TED Fellows Program recognizes people at work on future-shaping ideas, offering them tools to amplify the power of their vision. [Read More.](#)



Philipp Foehn

Congratulations to Philipp Foehn (Scaramuzza's lab), who has successfully defended his PhD dissertation titled "Agile Aerial Autonomy: Planning and control", on December 14, 2021. His reviewers were: Prof. Moritz Diehl, Prof. Luca Carlone, and Prof. Roland Siegwart.



NCCR ROBOTICS OPEN POSITIONS

Postdoctoral scientist and PhD opportunities at EPFL

Floreano's lab has two openings - one for a senior scientist in aerial robotics (topics of interest include bio-inspired systems (insects, birds, bats) and multi-modal locomotion (flying, perching, hopping, grasping, etc.) 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.](#)



Assistant Professor at ETH Zurich

The Department of Materials (www.mat.ethz.ch) at ETH Zurich invites applications for the position of Assistant Professor (Tenure Track) of Robotic Materials. The department is searching for excellent candidates to develop a world-leading research program in robotic materials, i.e. new materials whose properties enhance robotic functionality. The candidate will constitute the focus of a strong ETH collaborative network, involving colleagues engaged in robotics and the human-robot interface in other departments. All details [here](#).



Field Engineer at ANYbotics

The NCCR Robotics startup is looking for a Field Engineer as of March/April 2022 or upon availability. The candidate will have to organize and conduct pilot deployments, customer projects, proof of concept tests and events around the world; educate new ANYmal users in training sessions and help them set up their projects; provide feedback from the customers as input to development teams. [Read more](#).



Alahi lab

The Visual Intelligence for Transportation (VITA) lab at EPFL has several postdoc positions on the topics of deep learning, computer vision, and machine learning for transportation. Potential research projects include: Depth estimation from any sensing setup (monocular, stereo imaging...); Perceiving humans: a multitasking perspective; Perceiving everything; Social Forecasting. You will develop new methods to predict humans or vehicles motion trajectories for autonomous vehicle applications. [Read more](#).



PRESS COVERAGE

The Economist

The British magazine featured the work of Davide Scaramuzza's lab with event cameras in its Science & Technology section on 29 January, highlighting the potential of the technology for drones, robots and driverless cars. [Read more](#).



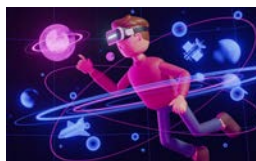
Women changing science in Switzerland

Margarita Chli was featured in a Swissinfo special article on 11 February, the International Day of Women and Girls in science, among four women who are changing the face of scientific research in Switzerland. [Read more](#).



Article in Nautilus

Former NCCR Robotics member Jennifer Miehlebradt was interviewed for an article in *Nautilus* on the applications of virtual reality for children's development. [Read more](#).



Aude Billard on RTS

Aude Billard, director of the EPFL Algorithms and Learning Systems Laboratory, and former NCCR member José Millan, talk about a brain-connected machine learning computer program that allows robots to adjust behavior based on the brain impulses they receive. [Listen to the episode \(in French\)](#).



Coverage of Courtine's work

The publication by Grégoire Courine and Jocelyn Bloch (see above) in *Nature Medicine* has been extensively covered in international media, including [The Guardian](#), [CNN](#), [The Independent](#), [Le Monde](#), [El Pais](#) and more.



NEW VIDEOS

Event guided depth sensing

ANYmal learns to hike



SELECTED NCCR ROBOTICS PUBLICATIONS *

L. Bauersfeld, D. Scaramuzza. Range, Endurance, and Optimal Speed Estimates for Multicopters, *Robotics and Automation Letters (RAL)*, 2022

Buetler Karin A., Penalver-Andres Joaquin, Özen Özhan, Ferriroli Luca, Müri René M., Cazzoli Dario, Marchal-Crespo Laura, Tricking the Brain” Using Immersive Virtual Reality: Modifying the Self-Perception Over Embodied Avatar Influences Motor Cortical Excitability and Action Initiation, *Frontiers in Human Neuroscience* (2022)

M.Chevalier, C. Giang, L. El-Hamamsy, E. Bonnet, V. Papaspyros, J.-P. Pellet, C. Audrin, M. Romero, B. Baumberger, F. Mondada, ,The role of feedback and guidance as intervention methods to foster computational thinking in educational robotics learning activities for primary school, *Computers & Education* (2022)

G. Cioffi, T. Cieslewski, D. Scaramuzza, Continuous-Time vs. Discrete-Time Vision-based SLAM: A Comparative Study, *Robotics and Automation Letters (RAL)*, 2022.

Gantenbein Jessica, Dittli Jan, Meyer Jan Thomas, Gassert Roger, Lamercy Olivier, Intention Detection Strategies for Robotic Upper-Limb Orthoses: A Scoping Review Considering Usability, Daily Life Application, and User Evaluation, *Frontiers in Neurorobotics* (2022).

A. Loquercio, A. Saviolo, D. Scaramuzza. AutoTune: Controller Tuning for High-Speed Flight. *Robotics and Automation Letters (RAL)*, 2022

N. Messikommer, D. Gehrig, M. Gehrig, D. Scaramuzza Bridging the Gap between Events and Frames through Unsupervised Domain Adaptation. *Robotics and Automation Letters (RAL)*, 2022

Meyer, J.T., Gassert, R. & Lamercy, O. An analysis of usability evaluation practices and contexts of use in wearable robotics. *J NeuroEngineering Rehabil* (2021).

F. Nan, S. Sun, P. Foehn, D. Scaramuzza, Nonlinear MPC for Quadrotor Fault-Tolerant Control. *Robotics and Automation Letters (RAL)*, 2022

Nasir, J., Kothiyal, A., Bruno, B. et al. Many are the ways to learn identifying multi-modal behavioral profiles of collaborative learning in constructivist activities, *International Journal of Computer-Supported Collaborative Learning* (2021)

J.L. Paneque, J.R. Martinez-de Dios, A. Ollero, D. Hanover, S. Sun, A. Romero, and D. Scaramuzza. Perception-Aware Perching on Powerlines with Multirotors. *Robotics and Automation Letters (RAL)*, 2022

R. Penicka, D. Scaramuzza, Minimum-Time Quadrotor Waypoint Flight in Cluttered Environments. *Robotics and Automation Letters (RAL)*, 2022

A. Piatti, G. Adorni, L. El-Hamamsy, L. Negrini, D. Assaf, L. Gambardella, F. Mondada, The CT-cube: A framework for the design and the assessment of computational thinking activities, *Computers in Human Behavior Reports* (2022).

W. Stewart, E. Ajanic, M. Müller and D. Floreano, How to Swoop and Grasp Like a Bird With a Passive Claw for a High-Speed Grasping, *IEEE/ASME Transactions on Mechatronics* (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](#).

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 and SUPSI to work on wearable, rescue and educational robots.



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