

Press release

TEN TEAM QUALIFY FOR AUTONOMOUS DRONE RACE

Leipzig, April 19, 2024

The Federal Agency for Disruptive Innovation (SPRIND) announces the participants of the SPRIND Funke "Fully Autonomous Flight". Out of the 14 teams of the first stage, the expert jury with representatives from academia and business selected ten teams to further develop their technology to be ready for the final drone race in September 2024 at Erding Air Base. The aim of this innovation competition is to develop fully autonomous drones that can fly safely even under adverse conditions and in the face of a range of disruptive factors.

Logistics and mobility are among the cornerstones of our economy and society. A declining pool of skilled workers combined with high and growing demands on mobility and logistics, especially in rural areas, calls for new approaches. Unmanned, largely manually controlled aircraft are already an important addition in many areas of application, such as the maintenance of industrial plants or in surveying technology. Fully autonomous flight could open up further fields of application, ranging from logistics and delivery services to rescue missions, inspections and long-term monitoring in agriculture. This in turn could be a first important step towards the vision of autonomous of passenger transportation. There is no doubt that flight systems without pilots will profoundly change our transportation systems in the near future and unleash their disruptive potential.

The following ten teams were selected to take part in the second and final stage:

- **UAV with Battery-Swap-UGV:** AEROTATE is specialised in the development of smart high-performance batteries designed specifically for robotic applications such as drones. For the Challenge, AEROTATE together with UAV-DEV GmbH, that is specialised in flight controllers, is presenting a concept that aims to optimise the endurance of drone by transporting the drone on a ground vehicle and replacing the batteries automatically as required. This method significantly extends the flight time, reduces downtime, and opens up a wide range of possible applications.
- **PathStrider:** The team presents an approach based on proven technologies and consistently implemented safety concepts. The result is a powerful and reliable drone that enables battery-based flights lasting for hours and a remarkable navigation performance in GPS-shielded environments by combining various sensor technologies.
- **BatFox:** With a new software and hardware concept, the team lead by Ivo Zell and Manuel Wustrau, aims to enhance the robustness and safety of the drone while ensuring complete autonomy. Their coaxial octocopter is built for high agility and enhanced stability of its onboard sensors. It features a hybrid power system that significantly extends its flight duration. On top, the full cage design of the rotors ensures safety and reliability in complex mission.
- **SIMON:** The team develops AI-based control systems for autonomous applications that are characterised by adaptivity and modularity. With their approach, they are moving systems with an already high degree of automation further towards autonomy. The basis for security, reliability and trustworthiness is openness: open-source software, open hardware standards and open communication protocols. At the same time, there is a paradigm shift from hard-

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coded and monolithic to modular, flexible and situation-dependent algorithms, including the adaptation of behavior in real time based on changing specifications.

- **AI-Flight – Beyond Vision:** The team presents a modular drone system that can be equipped with a variety of sensors and cameras, promising unrivaled autonomy in flight. The specially developed drone control system makes it possible to design, monitor and analyze missions – with integrated functions such as map creation, remote control and comprehensive flight history.
- **Hybrid Aerospace Hypogriff:** The team specializes in creating drones that excel in environments with limited satellite navigation and radio communication. They are showcasing their quadcopter, "Hypogriff," at the Funke, aiming for precise, autonomous payload delivery in challenging conditions. Beyond the competition, the team focuses on developing high-speed drones equipped with engines or hybrid gas turbines, targeted at reconnaissance, drone defense and other applications.
- **NOTUS:** The founders of the Norwegian-based start-up Aviant AS met at Massachusetts Institute of Technology in 2020. Since then, Lars Erik Fagernæs and his team have become pioneers in VTOL technology. They have two operational bases for autonomous last-mile deliveries and offer one of the first fully functional drone delivery services in Europe. The team has already tested its technology on more than 4,000 flights covering a total distance of over 40,000 kilometers. The focus is now on expanding the range of applications, for example in urban areas.
- **Robust, Agile, and Distributed UAV Swarm:** The Fly4Future team, a spin-off from the Technical University of Prague, is pursuing a multi-drone approach. It uses a self-developed system based on the autonomous collaboration of drones. The aim is to develop technologies that enable drones to create maps autonomously. This technology enables the use of the full propulsion power of the UAVs and agile flight maneuvers at the limit of dynamic boundaries.
- **UBADRON:** The team around Prof. Uijt de Haag from the Technical University in Berlin focuses on an innovative dual-drone system, engineered to work and solve tasks together. The first low-flying drone navigates below 25 meters and delivers payloads to its final destinations. Hovering above, its companion drone takes flight under 100 meters, meticulously mapping the terrain beneath and vigilantly scanning for unexpected obstacles or aerial vehicles, ensuring the safety and success of its partner below.
- **AMI-HighTech Flyers:** Prof. Markus Ryll from TU Munich and his team are pursuing an approach based on the integration of advanced navigation and intelligent movement strategies as well as the use of reliable control systems and artificial intelligence. This combines superior flight control, efficient pathfinding and instant data processing in one approach.

The SPRIND Funke has a duration of nine months in two stages. In the 2.5 months of stage 1, SPRIND supported the participating teams with up to 70,000 euros. Stage 2 provides up to 80,000 euros for the development of a prototype and the final participation in the "Drone Race" at Erding Air Base.

The teams will be supported, advised and networked with experts by SPRIND for the duration of the innovation competition. The Erding Air Base provides the teams with a unique test site. This is made possible by a collaboration between SPRIND and the Soldier Innovation Lab. Further information can be found at <https://www.sprind.org/en/challenges/funke-fully-autonomous-flight/>

About SPRIND Challenges

SPRIND Challenges and SPRIND Funken are innovation competitions in which the participating teams receive quick and unbureaucratic financial support to develop solutions for the major social and technological challenges of our time. In the SPRIND Challenges, the teams compete in a multi-stage competition. At the end of each stage, the teams' work is evaluated and only the best remain in the competition and receive further financial support to develop their idea further.

Like its big sister SPRIND Challenges, SPRIND Funke is an innovation competition for people with radically new ideas - but with a much shorter duration. The primary aim of SPRIND Funke is to quickly demonstrate new, ground-breaking technologies.

About SPRIND

The Federal Agency for Disruptive Innovation (SPRIND) was founded in 2019, with its registered office in Leipzig. The sole shareholder is the Federal Republic of Germany, represented by the Federal Ministry of Education and Research (BMBF) and the Federal Ministry of Economics and Climate Action (BMWK). SPRIND fills a gap in the German innovation landscape: it finds new, groundbreaking technologies for the major challenges of our time, while ensuring that the value created by the resulting companies and industries remains in Germany and Europe. SPRIND is financed by funds from the federal budget. It is managed by Rafael Laguna de la Vera and Berit Dannenberg.

CONTACT

Christian Egle
Press Officer
christian.egle@sprind.org

Federal Agency for Disruptive Innovations SPRIND
Lagerhofstr. 4
04103 Leipzig