GO FLY

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# Phase I Winning Teams Designs & Bios

- Team: Aeroxo LV // Device Name: ERA Aviabike
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## Team: Aeroxo LV // Device Name: ERA Aviabike

TEAM

AEROXO LV

DEVICE

ERA AVIABIKE

**Team's Device Description:** ERA Aviabike is a tilt rotor aerial vehicle type that combines VTOL capabilities of helicopter with range and speed of fixed-wing aircraft.

**Team Captain:** Vladimir Spinko is the ERA Aviabike chief operating officer with multi-year experience in technology, venture capital, and unmanned aerial vehicles (UAVs).

**Country:** Latvia

**Team Members:**

- Eldar Razroev — Aeroxo CEO & co-founder, ERA tiltrotor concept inventor. Serial entrepreneur with multi-year experience in aviation technology.
- Ilya Golubovich — Co-founder and Chief strategist. Multi-year experience in tech VC (managing partner of international US-based VC fund).
- Aleksander Remizov — Software developer/architect. Developed control system for all Aeroxo's tiltrotors (UAVs).
- Adel Khaliullin — Aeroxo's lead technologist and a lead pilot. Expert in manufacturing technology and UAV pilot.
- Vitaliy Grishanov — Chief aerodynamics researcher. Multi-year experience in science and research. Vitaliy leads theoretical development, modelling, and early stage experiments (i.e. aerodynamic tube experiments).
- Andrew Ukhnevich — Power electronics developer. Since he joined the Aeroxo team and redesigned its power electronics, the Aeroxo UAV failure rate has decreased by an order of magnitude.
- Fedor Zagumennov — Electronics engineer. He joined Aeroxo team as a final year bachelors student three years ago (UAV development).
- Aleksander Krasnov — Designer who turned technical concept into product. Multi-year experience in motorbike, automotive and industrial design.

# Phase I Winning Teams Designs & Bios

## Team: Blue Sparrow // Device Name: Blue Sparrow


**Team's Device Description**: Students and faculty at Penn State University Aerospace Engineering designed Blue Sparrow to be scalable, robust, safe, and fun to fly.

**Team Captain:** Jack W. Langelaan is an associate professor of aerospace engineering at Penn State University. Langelaan holds a B.S. from Queen's University (Kingston, Canada), an M.S. from the University of Washington and a Ph.D. from Stanford University. His research focuses on state estimation, path planning, and flight control applied to unmanned air vehicles.

**Country:** United States

# Phase I Winning Teams Designs & Bios

**Team Members:**

- Eric Johnson — Co-captain. Professor of aerospace engineering at PSU; with B.S. from the University of Washington, M.S. from MIT and GWU, and Ph.D. from Georgia Tech. He is an instrument-rated private pilot with 23 years of experience in guidance, navigation and control research and development; with particular emphasis on helicopters, multirotors, fault tolerance, and flight validation.

- Amy Pritchett (Human factors and flight safety) — Professor and head of Aerospace Engineering at PSU; S.B., S.M., and Sc.D. from MIT. Dr. Pritchett served as Director of the Aviation Safety Program at NASA from 2008 to 2009. Her research focuses on the intersection of automated and intelligent technologies, expert human performance and safety-critical operations.

- ZhouZhou Chen — Majoring in aerospace engineering, graduating with B.S. in May 2018. Minoring in Information Science Technology for Aerospace engineering. Researched in rotorcraft de-icing with Dr. Jose Palacios and where his primary focus was on aircraft controls.

- John (Jack) Ciraulo — From Warren, NJ; he will be graduating in May 2018 with a B.S. in Aerospace Engineering.

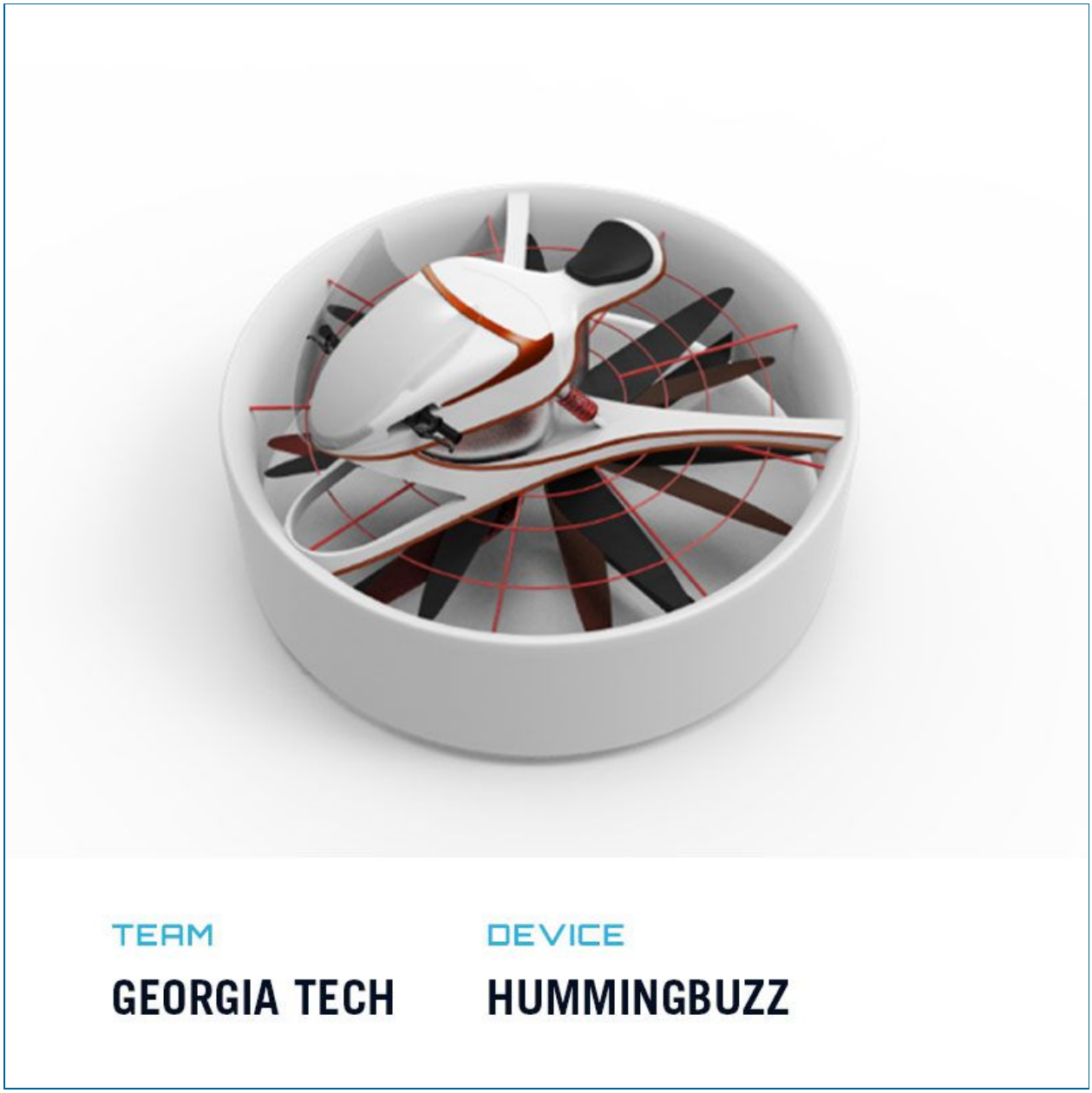
- Mostafa Elghorab — Majoring in aerospace engineering, graduating with B.S. in May 2018. Currently the president of Aero Design Club and learning assistant for an aerospace class. Researched in rotor noise analysis with Dr. Kenneth S. Brentner. Primary focus on aircraft performance.

- Wei-Cheng Hsu — Majoring in aerospace engineering, graduating with B.S. in May 2019. Minoring in Information Science Technology for Aerospace engineering, and researching robotic simulation with Dr. Alan Wagner. Main focus on SolidWorks and Aircraft Design.

- Alberto Spagnoli — Majoring in Aerospace Engineering, graduating with B.S. in May 2018. Primary focus is engineering design. Won engineering design competition for ArcelorMittal under professor Wallace Catanach.

- Jamil Wen — Majoring in aerospace engineering, graduating with B.S. in May 2018. Currently secretary of Aero Design Club. Primary focus on 3D modeling (SOLIDWORKS, AUTOCAD), aircraft design and CFD simulations.

## Team: Georgia Tech // Device Name: HummingBuzz




**Team's Device Description:** HummingBuzz utilizes the fully electric, ducted coaxial rotor configuration, with the fuselage on top, in the shape of a motorcycle.

**Team Captain:** Yuanxin (Adam) Shen is a PhD student of aerospace engineering at Georgia Tech. Shen obtained his bachelor's degree in aerospace engineering at Georgia Tech and has a special interest in the area of helicopter design optimization and flight mechanics.

**Country:** United States

**Team Members:**

- Brian Eberle (Flight control and Stability engineer) — PhD student in Mechanical Engineering, winner of 2018 "Vertical Flight Foundation (VFF) Scholarship". Erberle has extensive research on research and design experience in rotorcraft modeling and control, propulsion system modeling and control.

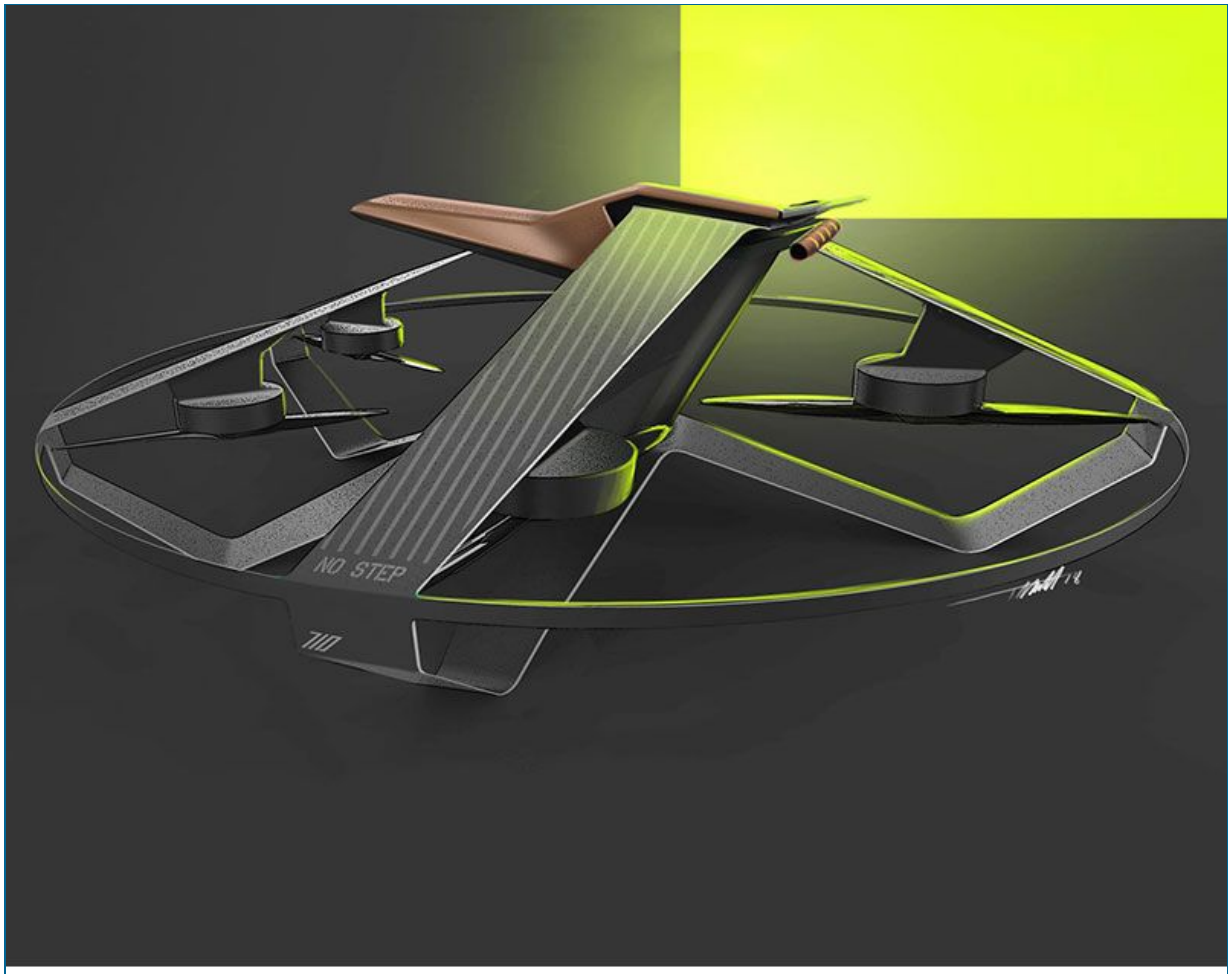
- Sylvester Ashok (Mentor) — Dr. Ashok is a Research Faculty member in the Rotorcraft Design Area at the School of Aerospace Engineering. He received his Ph.D. in Aerospace Engineering from Georgia Tech in 2013. Dr. Ashok has participated and mentored teams for multiple AHS design competitions.

- Alistair Joshua Sequeira (CFD, noise and structural analysis) — Sequeria is an undergraduate in the school of aerospace engineering.

- Shuyi (Suzie) Wang (aesthetics design and Human Engineering) — Wang is graduate student in the school of Industrial Design. Wang has unique work experience in aesthetic integrated human engineering design.

- Daniel Schrage (Safety and certification) — Schrage is a Professor in the School of Aerospace Engineering and the Director of the Vertical Lift Research Center of Excellence (VLRCOE).

## Team: Leap // Device Name: Vantage




TEAM
LEAP

DEVICE
VANTAGE

**Team's Device Description:** A five-rotor airbike.

**Team Captain:** Bruno Howard earned his degree in mechanical engineering from Imperial College London. He has founded, ran and raised funding for previous startups. He has also worked on the other side of the table, as a venture capitalist.

**Country:** United Kingdom

**Team Members:**

- William 'Pat' Branch (Product lead & head of engineering) — Pat is responsible for the development, management and execution of the overall engineering plan. As product lead, he is also responsible for signing off on most design decisions and ensuring that the design is certifiable and that safety factors are appropriate. Pat is a systems engineer and has spent 35 years working in the aerospace sector on projects such as the F-35 at Lockheed Martin, the B2 bomber at Northrop Grumman and the V-280 tiltrotor at Bell Helicopter, in which system safety has been his primary focus.

- Karim Gharaibeh (Powertrain & transmission) — In charge of the powertrain, it is Karim's responsibility to ensure that the combustion engine provides the power required by the vehicle at all stages of its duty cycle. In his role, he is also responsible for ensuring that the engine is compatible with the generator in the series hybrid configuration and that its fuel consumption allows for sufficient range. With a degree in Mechanical Engineering, he is currently completing his final year of a Ph.D. in turbomachinery, in which he is investigating the onset of surge in the compressor stages of combustion engines in industrial machinery.

- Jakob Howard (Power & electronic engineering) — Jakob is responsible for the development of the series hybrid powertrain and the distribution of power from the PDU to the rotors. In his role, Jakob is also responsible for the selection and electronic control of the electric motors, as well as the design of the emergency reserve battery unit that provides backup power in the case of a powertrain failure. Holding a Master's degree in engineering from the University of Oxford, Jakob has since worked as a powertrain engineer focused on high-speed actuator control and simulation, gearbox design and electromagnetic modelling, design, and testing of electric traction motors.

- Nikhil Aggarwal (Materials & Structural Engineering) — In charge of the vehicle's structural integrity, Nikhil is primarily responsible for the design of the vehicle frame. His focus is on the material selection and stress analysis to ensure that safety factors remain within acceptable ranges. With a degree in Mechanical Engineering from Imperial College London, Nikhil also has several years' experience working in the high-performance materials industry, focused specifically on the analysis and design of ballistic and heat-resistant materials for operation in extreme conditions.

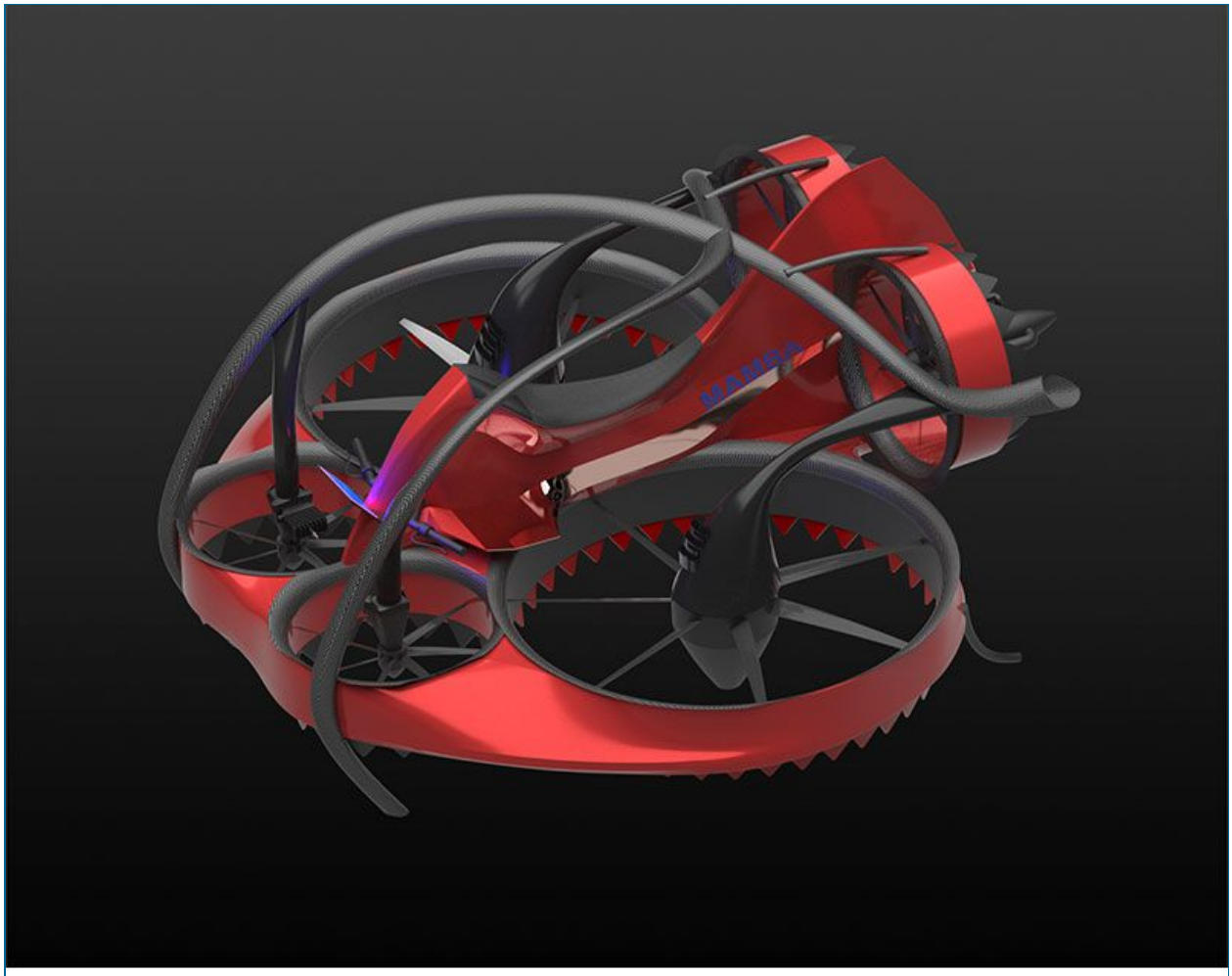
- Philipp Seeger (Vehicle concept design lead) — Philipp works with the whole engineering team and is responsible for ensuring the concept meets not only the GoFly requirements, but also those of the market and Leap's target customer. Holding a Master's degree in Aeronautical Engineering from the Technical University of Munich, Philipp has nearly a decade's experience working as a 'clean-sheet' concept design and systems engineer in the Defence & Space division and Future Projects Office at Airbus. Having also worked on a fuel cell UAV project at Boeing Phantom Works, Philipp has acquired the knowledge to design economically and technologically viable aircraft.

- Sangeet Shah (Software & vehicle control) — Sangeet is responsible for the automatic stabilisation and motor control system. Sangeet works closely with Howard to ensure that each of the motors can be appropriately under- and over-powered to compensate and provide the necessary feedback in various transient scenarios, most importantly in the case of a catastrophic failure of one of the motors or rotors. With a first class Master's degree in

Mechanical Engineering from Imperial College London, Sangeet works as a robotics and software engineer at a leading software consultancy firm.

- Ryan Wallace (Business development & funding) — Ryan is responsible for the business development and fund-raising efforts at Leap. Alongside building out a network of stakeholders and potential first customers, Ryan is working to raise the capital required to enable Leap to become a contender in the personal VTOL market, following completion of the GoFly challenge. As a serial entrepreneur and alumnus of Y-Combinator, Ryan already has a large network of fellow entrepreneurs, mentors and investors. Ryan also holds a degree in electrical & electronic engineering and supports the engineering team where necessary.

## Team: Mamba // Device Name: Mamba




TEAM

**MAMBA**

DEVICE

**MAMBA**

**Team's Device Description:** The Mamba is a hexcopter emphasizing safety, certifiability, and performance. Shrouded rotors and a tilting empennage are incorporated.

**Team Captain:** Lauren N. Schumacher a University of Kansas PhD student studying adaptive materials and guided munitions. She has worked in acoustics, advanced manufacturing, and propulsion projects in commercial aviation product development. Her aircraft design experience includes UCAV, airlifters, and electric urban air transit systems (1st PESA 2015).

**Country:** United States

**Team Members:**

- Ronald Barrett (Advisor) — Barrett earned Bachelor's, Master's and Ph.D. degrees in Aerospace Engineering from the University of Kansas and the US Army Rotorcraft Center of Excellence at Maryland. He has worked on innovative rotorcraft for more than 30 years for the US Army, Navy, Air Force, DARPA and more than 30 international aerospace corporations.

- Patrick McNamee (Blade design, stability) — McNamee graduated from the University of Kansas with a Bachelor's of Science degree in Aerospace Engineering and is currently a Master's student in Aerospace Engineering, studying cognitive control systems at the University of Kansas.

- Nicholas Donald Werner (Weights & balance, CAD, website, marketability) — Previously competed in an individual AIAA design competition as well as a team AIAA design competition. Graduating in May with a bachelor's in aerospace engineering from the University of Kansas. Previous internship with Honeywell Aerospace working on flight control systems integration.

- Joshua Donald Mudd (Systems Design, Acoustics, Safety) — Graduating in May 2018 with a Bachelor of Science in Aerospace Engineering from the University of Kansas. Previous experience with design competitions ~ AIAA Individual Design Competition. Interests in Flight Testing and Controls.

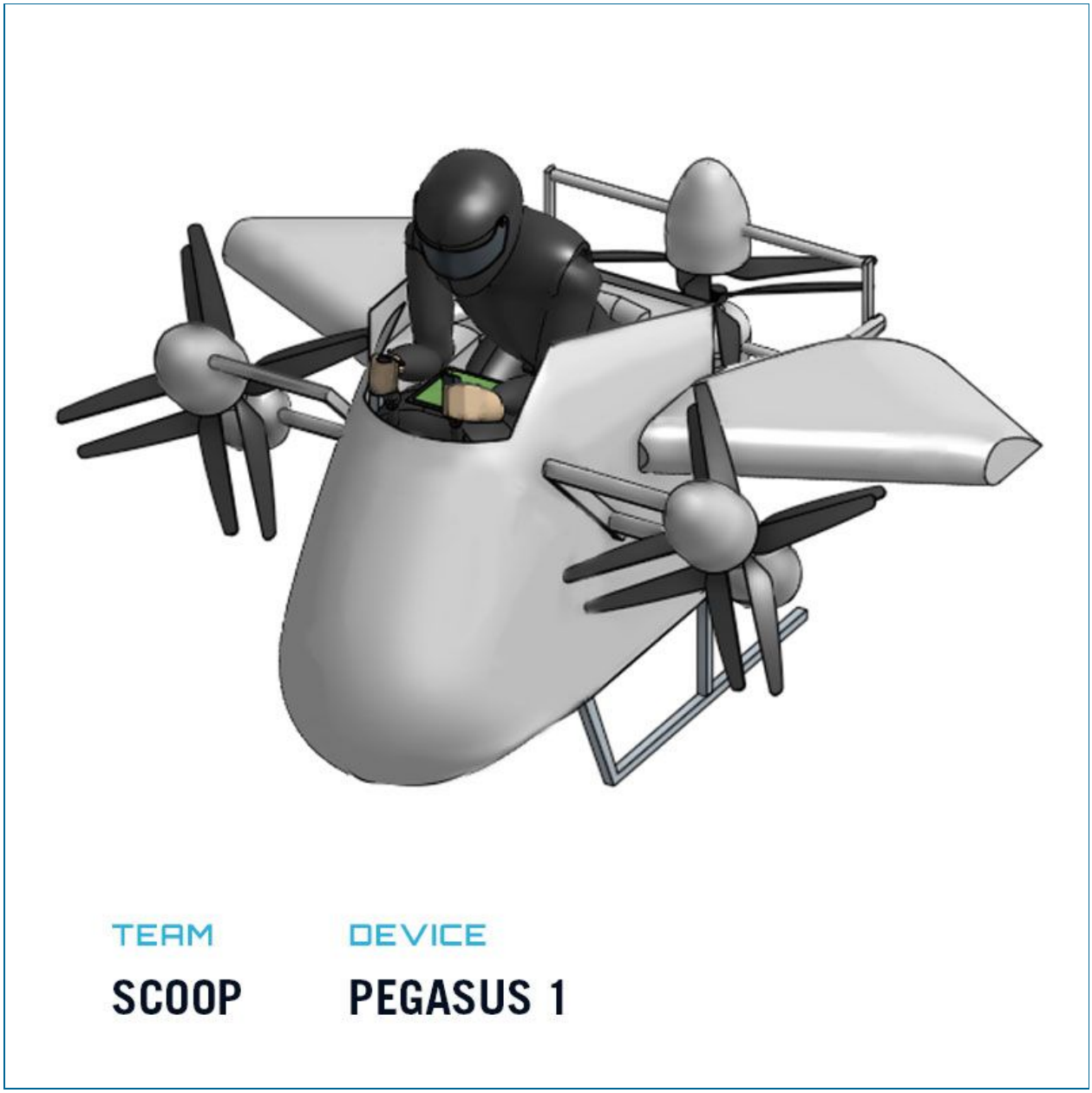
- John Haug (Ergonomics, manufacturing, acoustics) — Born in Austin, TX, attended the University of Kansas to participate in the Aerospace Engineering Program for his undergraduate degree. At KU, John has garnered experience in composites layup, engine testing, aerodynamics testing, etc. Through his aircraft design professor, John heard about the GoFly Competition, and wanted to participate.

- Dalton Prins(Acoustics, preliminary structures, safety & regulations) — Graduating from Rockhurst High School in 2013, he attended the University of Kansas for Aerospace Engineering with a scholarship through Naval ROTC. He will graduate in May 2018 with a B.S., commission as an Ensign in the United States Navy, and begin his flight training to become a Naval Aviator.

- Martin Mendoza (CAD, renderings) — Mendoza is graduate student completing his M.S. in Aerospace Engineering at the University of Kansas. For this project, he worked on assembling the CAD model and producing renders of the CAD model.

- Ankur Patil (Structures) — As a Ph.D. student in Aerospace Engineering, he has focused on designing antennas for remote sensing of polar regions, designing and manufacturing supporting structures for radar systems. He worked on aircraft structural analysis, antenna testing and manufacturing, and designed wings for the 'Wing in Ground Effect Vehicle' (1st PESA 2015).

## Team: Scoop // Device Name: Pegasus I




**Team's Device Description:** The Pegasus is a Y6 tilt rotor with a wing and a hybrid powertrain with a cruise speed of 70 knots.

**Team Captain:** Alex Smolen is a self-taught programmer who has experience creating and running a company. Smolen has built a full stack application and has in-depth experience with the design process. He has a bachelor's in accounting, and experience in flying and building multicopters.

**Country:** United States

# Phase I Winning Teams Designs & Bios

## Team: Silverwing // Device Name: S1


**Team's Device Description:** This device is a canard-wing configuration around a person in motorcycle-like orientation powered by two electric motors with ducted rotors. The aircraft makes a 90 degree transition from vertical take-off to horizontal cruise flight.

**Team Captain:** Victor Sonneveld is a Master of Science (M.Sc.) student in Flight Performance and Propulsion in the Aerospace Engineering department at the Delft University of Technology. He is a former member of the Delft Hyperloop team, where he wired harness and braking systems.

**Country:** Netherlands

**Team Members:**

- Rutger van Brouwershaven (Vehicle design & ergonomics) — M.Sc. student Integrated Product Design at faculty of Industrial Design. Former member of Delft Hyperloop team, SpaceX Hyperloop competition January 2017, vehicle interior design.

- Thom van den Homberg (CAD) — B.Sc. student Mechanical Engineering. Hands-on experience in robotics, like the Robohopper bio-inspired project.

- Quint Houwink (Control & stability) — B.Sc. student Aerospace Engineering. Former member of Delft Hyperloop team, permanent magnet levitation.

- Ralph Krook (Flight operations) — M.Sc. student Control and Simulation at faculty of Aerospace Engineering. Former member of Human Power Team Delft, aerodynamics engineer.

- Luuk van der Linde (Structures) — M.Sc.student Aerospace Structures and Materials at faculty of Aerospace Engineering. Former member of Delft Hyperloop team, chassis design and manufacturing

- James Murdza (Software & simulation) — B.Sc. student Aerospace Engineering. Former member of Delft Hyperloop team, embedded software and vehicle simulation.

- Victor Sonneveld (Flight performance) —M.Sc. student Flight Performance and Propulsion at faculty of Aerospace Engineering. Former member of Delft Hyperloop team, wiring harness and braking system.

- Olivier Witteman (Power systems) — B.Sc. student Aerospace Engineering. Former member of Delft Hyperloop team, battery system.

## Team: teTra // Device Name: teTra 3

TEAM TETRA

DEVICE TETRA 3

**Team's Device Description:** teTra 3 is not only efficient enough, but also stylish enough for commercial requirements.

**Team Captain:** Tasuku Nakai is a doctoral student in the department of mechanical engineering at the University of Tokyo, studying strength of materials, fracture mechanics, human injury assessment and structural design.

**Country:** Japan

**Team Members:**

- Masaru Okada (Industrial and creative design, Electric circuit design) — ID/UX designer in Softbank Corp., former: Electrical engineer at sony EMCS Corp.

- Koya Kuwamura (Aerodynamic design, Control system design) — Master of aerospace engineering from the Nagoya university, System engineer at Softbank Corp.

- Akihiro Mizutani (Project management) — Certified PMP, project engineer at Civil Aero-Engine Division, IHI corporation.

- Tetsuya Matsuhisa (Generator design and engine system design) — Engineer at Honda R&D Co., Ltd.

- Yasuyuki Shimizu (Structural analysis) — Research student in the department of mechanical engineering at the University of Tokyo.

- Kazunori Saito (Finance, sponsorship, funding) — Chief financial officer at iROBOTICS Inc.

- Kenji Kajitani (Building, securing, property rights) — Chief technology officer at iROBOTICS Inc.

# Phase I Winning Teams Designs & Bios

## Team: Texas A&M University // Device Name: Harmony

TEAM

**TEXAS A&M UNIVERSITY**

DEVICE

**HARMONY**

**Team's Device Description:** A high-TRL compact rotorcraft designed to minimize noise and maximize efficiency, safety, reliability, and flight experience

**Team Captain:** Dr. Moble Benedict is an assistant professor of aerospace engineering and founder of Advanced Vertical Flight Laboratory (AVFL) with 15 years of experience in VTOL aircraft concepts. He was awarded the 2012 AIAA Young Engineer-Scientist Award, the 2016 AHS Bagnoud Award and won the $25K Grand Prize at the Lockheed Martin Innovate the Future Global Challenge.

**Country:** United States

# Phase I Winning Teams Designs & Bios

**Team Members:**

- David Coleman (CAD drawings) — A Ph.D. student conducting research at AVFL, TAMU (Texas A&M University) on a robotic hummingbird concept, which he has designed, built and flight tested. He has won numerous awards for his work and was one of the semi-finalists for the 2018 MIT Lemelson Award.

- Hunter Denton (Built GoFly proof of concept) — A Masters student in AVFL, TAMU. He has designed and built numerous small scale, coaxial helicopter systems including the GoFly proof of concept.

- Nima Ershad (Electrical systems modeling and design) — A Ph.D. student at electrical and computer engineering department TAMU. He is experienced and interested in power electronics and its applications in motor-drives, design, prototyping and analysis of electrical machines and powertrains.

- Bharath Govindarajan (Overall design) — An assistant research professor at the University of Maryland with a focus on rotorcraft aerodynamics and helicopter design. He has participated and won in the American Helicopter Society's annual international design competition both as a graduate student and faculty advisor.

- Eric Greenwood (Rotor acoustics analysis) — Received a Ph.D. in Aerospace Engineering from the University of Maryland and is a researcher at NASA Langley, developing rotor noise modeling methods and experimental techniques. He was awarded the NASA Early Career Achievement Medal in 2016 and the 2018 AHS Bagnoud award for this work.

- Atanu Halder (Rotor design optimization) — Pursuing his Ph.D. in Aerospace Engineering at TAMU. He works at AVFL developing design framework of next generation VTOL UAVs based on a novel cyclorotor concept. He won best paper award at 2017 AHS Forum and Vertical Flight Foundation scholarship in 2018.

- Adam Kellen (Rotor acoustic testing) — A Master's student in Aerospace Engineering at TAMU. Adam's specialties include mechanical design, CAD, and experimental testing. For the past 3 years he has worked at AVFL to understand the scalability of a novel cyclorotor concept.

- Vinod Lakshminarayan (Rotor CFD simulation) — A research scientist at Science and Technology Corporation, NASA Ames Research Center. He is one of the primary developers of the high performance computational software, Helios, which is used for design and analysis of complex rotary wing systems at DoD and US helicopter companies.

- Bochan Lee (Flight dynamics and controls modeling) — Has 7 years of experience as a S. Korean Navy UH-60 pilot and a current graduate researcher at AVFL, TAMU working on autonomous helicopter ship landing. He won the 2018 Vertical Flight Foundation scholarship.

- Andrew Riha (Rotor acoustics analysis) — A Masters student at the aerospace department of TAMU working on boundary layer transition.

- Carl Runco (Control system design) — A Ph.D. student at the Advanced Vertical Flight Lab of TAMU and has several years' experience designing, creating, and flying one-of-a-kind VTOL

rotorcraft. This hands-on experience will be valuable in realizing the flight capable model from our design.

- Farid Saemi (Electric systems design/modeling and avionics) — A Ph.D. student at TAMU. He works at AVFL and his research is focused on developing physics-based motor, controller and battery models.

- Ananth Sridharan (Rotor aeromechanics modeling) — A Research Scientist at the University of Maryland, College Park. During the last 10 years, he has worked on several aspects of helicopter design, including flight dynamics and control, vibration prediction, aeromechanics, design optimization and preliminary sizing.

- Vishaal Subramanian (Blade structural design and stress analysis) — A Masters student at the Aerospace department of TAMU. He has participated in SAE Aero Design competitions from 2014-2016.

- Aswathi Sudhir (Composite blade modeling) — A Ph.D. student in Materials and Structures from Aerospace department of TAMU. Her research focus is on computational damage mechanics in composite materials.

## Team: Trek Aerospace // Device Name: FlyKart 2


TEAM

**TREK AEROSPACE**

DEVICE

**FLYKART 2**

**Team's Device Description:** FlyKart 2 is a single-seat, open-cockpit, 10-rotor, ducted fan, electrically-powered, VTOL aircraft.

**Team Captain:** Robert Bulaga is the president and chief technical officer of Trek Aerospace. Bulaga is an expert in ducted propeller technology and currently works with a number of companies on integrating this technology into their platforms. He has participated in the design and development of numerous aircraft over the past 30 years and has developed CFD code for designing shrouded propeller assemblies in conjunction with Stanford University.

**Country:** United States

**Team Members:**

- Jose Fierro (Business management, electronics, flight test) — Fierro runs business development, program management, and flight testing for Trek Aerospace. He has helped Trek focus on commercial applications and recently was instrumental in helping Trek prototype a key technology demonstrator under-cost and ahead of schedule. He is a retired Marine Corps F/A-18 Pilot with multiple combat deployments, and military experience as Director of Risk Management, Maintenance, and Operations. He has experience building and flight testing aircraft. Fierro has licenses for CFI, ATP, Remote Pilot. He received an M.B.A. from the Haas School of Business, UC Berkeley, an M.S. in Electrical Engineering from Stanford University, and a B.S. in Electrical Engineering from Stanford University.

- Joshua Portlock (Controls) — Portlock is the ElectroDucts Product Manager at Trek Aerospace, the Founder and Chairman at Electro.Aero Pty Ltd, and the Director and CTO at Scientific Aerospace. His research focus areas include electric propulsion optimization, VTOL flight control, autonomous navigation, sensor stabilization, payload integration and development project management. He developed state-of-the-art, ducted quadrotor, unmanned aircraft technology in 2006 and then licensed that technology to Cyber Technology to commercialize as cyberQuad. He received a B.S. in Mechatronic Engineering from the Curtin University of Technology.