

MOVE

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Center for Mobility with Vertical Lift

School of Engineering



Kickoff Meeting, October 2-3, 2018

Program Book



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Center for Mobility with Vertical Lift

Welcome

Fueled by explosive growth in the emergent field of electric VTOL aircraft, as well as the U.S. DoD's interest in high-speed VTOL aircraft, vertical lift technology is undergoing a major renaissance and is at one of the most exciting points in its development history. However, many fundamental research challenges must be addressed to deliver on this promise. Recognizing the need for breakthroughs at the frontiers of knowledge, as well as the exciting opportunities this offers, Rensselaer Polytechnic Institute established the Center for Mobility with Vertical Lift (MOVE) in Spring 2018 (<http://move.rpi.edu>). Ten RPI faculty and two affiliated faculty with a collective expertise in VTOL aeromechanics, multicopters, advanced VTOL configurations, control and autonomy, flying qualities, diagnostics and structural health monitoring, computational fluid dynamics, experimental aerodynamics, nanomaterials, and design optimization are actively working on projects under MOVE. The center currently has twenty-one Ph.D. students. We are very grateful to our government/industry sponsors and collaborators (NRTC, ARL, AATD, AMRDEC, ONR, NYSERDA, Israel Ministry of Defense, Terrafugia, UTRC, Sikorsky, and Boeing) for their support and engagement.

I am absolutely delighted to welcome you to this kickoff meeting, highlighted by the center's official opening by RPI's President, The Honorable Dr. Shirley Ann Jackson, and the presentation of the Paul E. Hemke Lecture, the Lila and Robert G. Loewy Lecture, and two Leaders in Engineering Lectures. This Kickoff Symposium also includes a very exciting panel discussion on electric VTOL, the opportunity to see a UH-60 Black Hawk Helicopter on campus, and interaction with our Ph.D. students during the tour of MOVE. My heartfelt gratitude goes out to all of the attendees – for your support, and for being an integral part of this very important occasion for the Center for Mobility with Vertical Lift.



Prof. Farhan Gandhi

Rosalind and John J. Redfern Jr. '33 Endowed Chair in Aerospace Engineering
Director, Center for Mobility with Vertical Lift (MOVE)
Aerospace Program Director
Email: fgandhi@rpi.edu

Agenda

Opening of **MOVE – The Center for Mobility with Vertical Lift**
School of Engineering, Rensselaer Polytechnic Institute
October 2 and 3, 2018

Tuesday, October 2, 2018

10:30–10:45	Pick up of Badges, Russell Sage Ballroom	●
10:45–11:40	Leaders in Engineering Lecture: “The Electric VTOL Revolution” Speaker: – Mr. Mike Hirschberg , Executive Director of the Vertical Flight Society	●
11:40–12:35	Paul E. Hemke Lecture: “New Forces Shaping Research and Development in the U.S. Army” Speaker: – Mr. Jeff Singleton , Director of Technology, U.S. Army	●
12:35–1:20	Lunch	
1:20–2:05	Viewing of UH-60 Black Hawk on '86 Field, and witnessing of fly-out	
2:05–3:05	Tour of MOVE , 2303 Jonsson Engineering Center	●
3:15–4:10	Lila and Robert G. Loewy Lecture: “The Dawn of eVTOL” Speaker: – Mr. Mark Moore , Director of Engineering, Vehicle Systems, Uber Elevate	● ○
4:10–5:05	Leaders in Engineering Lecture: “Design Considerations for Vertical Lift Mobility, or Things to Think About Before You Grow Your Drone” Speaker: – Mr. Steve Weiner '78 , Chief Engineer, Joint Multi-Role Technology Demonstrator, Sikorsky Aircraft Corporation	● ○
6:00–8:30	Social Hour and Dinner at the Franklin Plaza Rooftop Terrace, 4 4th St., Troy, NY 12180 (Rensselaer faculty and distinguished guests)	

- Russell Sage Ballroom
- Jonsson Engineering Center
- CBIS
- Bruggeman Room
- Bruggeman Room Foyer

Wednesday, October 3, 2018

8:00–9:00	<p>Breakfast Roundtable</p> <p>Mr. David Koopersmith '78 with student representatives of AHS, AIAA, ASME, Engineering Ambassadors, Society of Women Engineers (SWE), National Society of Black Engineers (NSBE), and Society of Hispanic Professional Engineers (SHPE) 5030 Jonsson Engineering Center</p>	●
9:30–10:10	<p>MOVE Opening by The Honorable Dr. Shirley Ann Jackson</p> <p>President of Rensselaer Polytechnic Institute Other speakers who will make brief comments at the opening:</p> <ul style="list-style-type: none"> – Dr. Farhan Gandhi, Rosalind and John J. Redfern Jr. '33 Endowed Chair in Aerospace Engineering and MOVE Director – Mr. David Koopersmith '78, Vice President and General Manager, Boeing Vertical Lift – Dr. Vineet Sahasrabudhe, Director of Engineering Sciences, Sikorsky Aircraft Corp. – Dr. Shekhar Garde, Elaine and Jack Parker Endowed Chair and Dean of Engineering 	● ○
10:10–10:30	Coffee and Pastries	● ○
10:30–12:15	<p>Panel Discussion: “Electric VTOL: Current Status and Technical Challenges”</p> <p>Moderator:</p> <ul style="list-style-type: none"> – Mr. Elias Rigas, Chief, Vehicle Applied Research Division, ARL <p>Panelists:</p> <ul style="list-style-type: none"> – Mr. J. Scott Drennan, VP Innovation, Bell – Mr. Chris Jaran '78, CEO, Terrafugia – Mr. Matt Ciuca, Director of Strategy, Commercial Programs, Aurora Flight Sciences – Mr. Mike Duffy, Project Manager, Boeing Research and Technology – Dr. Rajneesh Singh, Group Lead, Vehicle Applied Research Division, ARL – Dr. Inderjit Chopra, Alfred Gessow Professor, University of Maryland 	● ○
12:15–1:30	Lunch (Rensselaer faculty and guests)	●
1:30–2:30	<p>MOVE Advisory Council Meeting</p> <p>Members:</p> <p>Dr. Kenneth Rosen '65 (Sikorsky, retd.), Mr. Chris Jaran '78 (Terrafugia), Mr. Mike Duffy (The Boeing Co.), Dr. Vineet Sahasrabudhe (Sikorsky Aircraft Corp.), Mr. Neil Garrigan '86 (GE Global Research)</p>	

Guest Biographies



Tuesday, October 2, 2018

10:45–11:40, Russell Sage Ballroom

Leaders in Engineering Lecture: “The Electric VTOL Revolution”



Mr. Mike Hirschberg

Executive Director of the Vertical Flight Society

Mike Hirschberg became the Vertical Flight Society Executive Director in June 2011, after 20 years in the aerospace industry. As the Executive Director, he represents the vertical flight technical community and advocates for the advancement of vertical flight research and technology. He is the publisher of all society publications, including Vertiflite, the Journal of the AHS, and the Annual Forum Proceedings. He was a principal aerospace engineer with CENTRA Technology Inc., providing technical and program management support for over 10 years to the Defense Advanced Research Projects Agency (DARPA) and Office of Naval Research (ONR) on advanced aircraft and rotorcraft concepts. He worked from 1994-2001 in the Joint Strike Fighter (JSF) Program Office, supporting the development of the X-32 and X-35 vertical flight propulsion systems. He served as the Managing Editor of the Society's Vertiflite magazine from 1999-2011, and had been a contributing author since 1997. Mr. Hirschberg is an internationally known lecturer and is the author/co-author of more than 200 publications on helicopter, V/STOL, and advanced aircraft developments, including three books.



Tuesday, October 2, 2018

11:40–12:35, Russell Sage Ballroom

Paul E. Hemke Lecture: “New Forces Shaping Research and Development in the U.S. Army”



Mr. Jeff Singleton

Director of Technology, U.S. Army

Jeff Singleton is a member of the Senior Executive Service and currently serves as the Army's Director for Technology, directing the basic, applied, and advanced technology development research program for all Army laboratories, research, development and engineering centers, including programs at the Army Research Development and Engineering Command, the Army Research Institute, the Army Corps of Engineers, the Medical Research and Materiel Command, and the Space and Missile Defense Technical Center with a combined annual budget of approximately \$2.4B. He began his career as a research engineer with the Department of the Army, first in the field of experimental rotorcraft testing and analysis, then later as Team Leader and Division Chief for rotorcraft dynamics, structural mechanics, and aeromechanics. His extensive background in science and technology investigation spans more than two decades of fundamental research, advanced technology development, and acquisition.



 **Tuesday, October 2, 2018**
3:15–4:10, CBIS Bruggeman Room

Lila and Robert G. Loewy Lecture: “The Dawn of eVTOL”



Mr. Mark Moore

Director of Engineering, Vehicle Systems, Uber Elevate

Mark D. Moore worked for NASA for 32 years before becoming the Uber Engineering Director of Aviation. Uber has developed a transformative vision for urban mobility called Elevate to implement short-range aerial ridesharing to provide a low infrastructure alternative to ground highway gridlock. Throughout his entire career, he has performed conceptual design studies of advanced aircraft, with a focus on small powered-lift vehicles. Over the past decade, he has focused his attention on the development, of Distributed Electric Propulsion (DEP) and autonomy technologies as enablers of new types of vertical flight aircraft. He led three rapid concept-to-flight demonstrator teams that resulted in the NASA GL-10 VTOL UAV, the LEAPTech Mobile Ground Rig full-scale DEP wing, and the SCEPTOR X-57 (the first NASA Xplane in over a decade). His research focuses on understanding how to best integrate emerging technologies to achieve ultra-low noise, redundant propulsion, robust control, and low operating cost ESTOL and VTOL aircraft. He has authored many technical publications promoting a future vision of large-scale distributed and on-demand aviation. He received his master’s degree in aeronautical engineering from Stanford University and is currently completing his Ph.D. at Georgia Tech.

 **Tuesday, October 2, 2018**
4:10–5:05, CBIS Bruggeman Room

Leaders in Engineering Lecture: “Design Considerations for Vertical Lift Mobility, or Things to Think About Before You Grow Your Drone”



Mr. Steve Weiner

Chief Engineer, Joint Multi-Role Technology Demonstrator, Sikorsky Aircraft Corporation

Steve Weiner is the Chief Engineer for Sikorsky Innovations and the SB>1 DEFIANT™, and is responsible for the design, development and flight testing of Sikorsky’s advanced technology demonstrators. Steve joined Sikorsky in 1978, and as an Aerodynamicist was responsible for the performance of the S-75 ACAP, HH-60D, S-76 Fantail Demonstrator and LHX. Steve supported the RAH-66 Comanche program as Lead Aerodynamicist and Technology Manager. The RAH-66 met all Milestone II technical exit criteria. In 2003, Steve was named Chief Engineer for the X2 Technology™ Demonstrator which set an unofficial speed record for helicopters (250 knots) in 2010 and was awarded the 2010 Collier Trophy. The aircraft was inducted into the Smithsonian National Air and Space Museum in 2016. From 2005–2013, Steve served as Director of Engineering Sciences, responsible for the aeromechanics, mass properties, and survivability attributes of Sikorsky products. He holds 15 patents related to Fantail and X2 Technology™.

Guest Biographies



Mr. Robert Blackwell

RPI Alumnus

Mr. Blackwell received his B.S. and M.S. degrees in aeronautical engineering from RPI. He joined Sikorsky Aircraft in 1970 and worked in the Dynamics Group for 42 years, retiring in 2012. In that time he served as lead dynamics engineer on the XH-59A, RSRA X-Wing, Comanche and X2TM aircraft among others. For many years, he served as the Sikorsky Technical Fellow for Aeromechanics. He has authored more than a dozen technical papers, served as Chairman of the AHS Dynamics Committee and Associate Editor of the AHS Journal, and is a Fellow of the AHS. He is an inventor or co-inventor of several concepts for rotor design and helicopter vibration control. During his time at Sikorsky, he was an instructor in the Sikorsky Helicopter Principles Course and currently teaches a portion of the Penn State Rotary Wing Technology Short Course.



Dr. Peter Bi

NSWC Carderock Division Delegate

Peter Bi received his Ph.D. in aerospace engineering from the Rotorcraft Center of Excellence in the University of Maryland, 1991. As a researcher and technologist, Dr. Bi has conducted various pioneering researches in fixed and rotary wing aircraft related areas, which includes rotor/fuselage aerodynamics interactions, an innovative mathematical model to predict the environmental effects on rotor composite blade surface temperatures, and aerodynamics of ducted fan/propulsor, and fan-in-wing configuration. Currently, Dr. Bi is the S&T director in the Sea-based Aviation and Aeromechanics Branch at NSWCCD, overseeing a wide range of R&D projects including aeromechanics and ship aerodynamics, sea-based aviation & unmanned aerial systems, and experimental aerodynamics & wind tunnel test techniques. Dr. Bi has been serving as Subject Matter Expert (SME) to various DOD organizations including ONR, NAVSEA, DARPA, and NAVAIR. He has been active with AHS and AIAA and is an AIAA Associate Fellow.



Mr. Matt Ciuca

eVTOL Panelist

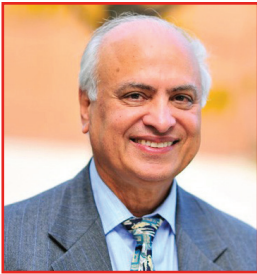
Mr. Ciuca joined Aurora Flight Sciences in 2016 from the corporate strategy consulting industry. At Aurora, he is responsible for developing analytics, recommendations, and strategy for business sector leaders with commercially focused programs. Mr. Ciuca has over 11 years of experience leading business transformation, market entry/adjacency, acquisition due diligences, and strategy projects within the aerospace and defense industry and broader industrial goods industry. He holds a B.S. in mechanical engineering from Clemson University and an MBA from the Tepper School of Business at Carnegie Mellon University.

Guest Biographies



Mr. Carvil Chalk
U.S. Army AMRDEC Delegate

Mr. Carvil Chalk is the Acting Chief Engineer for the AMRDEC Aviation Development Directorate (ADD) where he directs a team of Focus Area Leads to investigate, assess, and recommend S&T programs designed to mature technologies and provide capabilities to the soldier. Mr. Chalk is responsible for the aviation S&T portfolio, budget for the Army Program Objective Memorandum, and for oversight of each funded activity, valued at more than \$200M annually. The S&T efforts ADD pursues are developed collaboratively with the Aviation Center of Excellence, the Future Vertical Lift Cross-Functional Team, and PEO Aviation. Mr. Chalk's permanent assignment is with the Redstone Test Center where he serves as the Director of Test Program Integration, leading his team to execute test business management for the more than 400 active aviation, missile, and sensor test projects. Mr. Chalk holds a B.S. in physics and M.S. in optics/lasers and aviation flight test; he is also a graduate of the U.S. Naval Test Pilot School, class 124, as an Airborne Systems Flight Test Engineer.



Prof. Inderjit Chopra
eVTOL Panelist

Inderjit Chopra received his Sc.D. (Aero & Astro) from MIT in 1977. After 4 and a half years at the NASA Ames/Stanford University Joint Institute of Aeronautics & Acoustics, he joined the University of Maryland in 1981, where he is currently the Alfred Gessow Professor in Aerospace Engineering, Distinguished University Professor, and Director of the Alfred Gessow Rotorcraft Center. His expertise covers aeromechanics of helicopters, including aeroelastic stability, active vibration control, composite blades, rotor health monitoring, aeroelastic optimization, smart structures, micro air vehicles, and comprehensive aeromechanics analyses. He has advised 54 Ph.D. and over 100 M.S. students. He is a recipient of the 2002 AIAA SDM Award, 2002 AHS Grover E. Bell Award, 2001 ASME Adaptive Structures and Material Systems Prize, 2002 A. J. Clark School of Engineering Faculty Outstanding Research Award, 2004 SPIE Smart Structures & Materials Lifetime Achievement Award, 2008 Indian Institute of Science Centenary Distinguished Alumni Award, 2009 AHS Alexander Klemin Award, 2012 AHS Igor Sikorsky International Trophy, 2016 ASME Spirit of St. Louis Aviation Medal, and 2018 AHS Nikolsky Honorary Lectureship. He is a Fellow of AIAA, a Technical Fellow and an Honorary Fellow of AHS, and a Fellow of ASME.



Mr. J. Scott Drennan
eVTOL Panelist

Scott Drennan serves as vice president of Bell's Innovation team. Scott joined Bell in 1993 after receiving a B.S. in aerospace engineering from the University of Maryland. He also holds a Masters of Liberal Arts from Southern Methodist University. Scott's career focus on advanced VTOL technologies and configurations has included work on the V-22, and more recently, as chief engineer of the Bell 609 program and director of air vehicle integration. He is currently a member of the NASA Advisory Council Aeronautics Committee. Scott is proud to carry on Bell's rich tradition of innovation. The innovation team's mission is to radically innovate technologies towards novel and coveted vehicle lift experiences. The team leverages Bell's core competencies and fearlessly embraces disruption to illuminate and secure Bell's future as an extraordinary technology company.

Guest Biographies



Mr. Mike Duffy

eVTOL Panelist, Advisory Council Member

Michael Duffy is currently a Senior Project Engineer working for Boeing Horizon X. His role is Propulsion Technology Lead for Boeing Cargo Air Vehicle. He has 15 years of experience at Boeing working in vertical lift technology. His expertise is in aerodynamics, propulsion, conceptual design, air vehicle performance, and unmanned vehicle test. He has an M.S. in aerospace engineering from Georgia Tech and a B.S. in aerospace engineering from PSU. He is also a part-time visiting scientist at Cornell University's Department of Aerospace and Mechanical Engineering.



Mr. Neil Garrigan

Advisory Council Member

Mr. Garrigan has a BSEE from RPI, a MSEE from Syracuse University and completed additional graduate work with the University of Wisconsin-Madison on advanced electric-drive systems. He began his career in GE Aerospace at the Aircraft Electronics Systems business working on advanced aircraft systems. Next, he joined the Aircraft Control Systems business performing advanced systems engineering for new product & next generation applications including engine & flight controls and More Electric Aircraft. Subsequently he spent 10 years at GE's Global Research Center, leading R&D teams for Aerospace, Transportation, and Energy applications. He next joined GE Aviation in Cincinnati for 10 years, expanding the business into adjacent integrated systems, namely integrated propulsion, power & thermal management, leading teams in Cincinnati, OH, and Lynn, MA. Mr. Garrigan has recently returned to GE's Global Research Center leading advanced systems & programs with particular focus on Electrification & Next Generation Propulsion Systems. His charter is to develop and demonstrate integrated systems & advanced technologies across the GE Aerospace & Transportation enterprises.



Mr. Chris Jaran

eVTOL Panelist, Advisory Council Member

Chris Jaran brings thirty years of experience in the technology and transport industries to his role as CEO of Terrafugia. Over the course of his extensive career, he has served in a number of roles with increasing responsibility, which have ranged from overseeing the development of major aircraft design to establishing and running operations for leading corporations in new markets. Most recently, Chris was Vice President and Managing Director at Bell Helicopters where he had overall responsibility for the company's operations in China. Prior to this, he was Operations Implementation Team Lead at Virginia-based TetraTech AMT, where he was involved in the Federal Aviation Authority's transition to integrated ground and space-based navigation systems and its modernization initiatives. Before joining TetraTech AMT, Chris spent more than twenty years at various subsidiaries of Sikorsky Aircraft Corporation in roles that included Chief Operations Officer, President, and General Manager.

Guest Biographies



Mr. David Koopersmith

Roundtable Speaker

Dave Koopersmith is vice president and general manager of Boeing Vertical Lift, a division of Boeing Defense, Space & Security (BDS), and the senior site executive for Boeing Philadelphia. He is a member of the BDS leadership team.

In this role Koopersmith oversees facilities in Pennsylvania as well as Arizona, and is responsible for business growth and program execution for a portfolio of cargo, tiltrotor, attack, and future vertical lift rotorcraft, including the AH-64 Apache, H-47 Chinook, AH-6 Little Bird, V-22 Osprey and SB>1 Defiant. Koopersmith, a team of more than 8,000 employees, and an international network of suppliers and partners, are focused on advancing rotorcraft technology to meet the current and future needs of customers around the globe.



Dr. William D. Lewis

U.S. Army AMRDEC Delegate

Dr. Bill Lewis spent decades in Army Aviation, and until earlier this year, as director for the Aviation Development Directorate (ADD), or Lewis managed and directed the execution of the Aviation Science and Technology program at AMRDEC including basic research, applied research, and advanced technology development. He provided direct leadership of the Aviation Applied Technology Directorate, the Aeroflightdynamics Directorate, and the Aviation Systems Integration Facility, and was responsible for the Army's multi-million-dollar aviation S&T program. He was also Office of the Secretary of Defense lead on rotorcraft technology and the director of the National Rotorcraft Technology Center responsible for the Vertical lift Consortium and the Vertical Lift Centers of Excellence. In 2018, Dr. Lewis was a recipient of the AHS Honorary Fellow award, and the Army Aviation Association of America Joseph P. Cribbins Department of the Army Civilian of the Year Award.



Dr. Mark Lopez

U.S. Army AMRDEC Delegate

Dr. Mark Lopez is an aerospace engineer at the U.S. Army Aviation Development Directorate – Ames. He leads the ADD flight control efforts in multirotor and electric VTOL configurations. His primary area of expertise is flight dynamics modeling and simulation, including system identification and physics-based models. He has extensive experience with a broad range of configuration sizes ranging from small group 1 multirotor UAS to manned-size rotorcraft, including JMR and FVL configurations. He received his Ph.D. from the Georgia Institute of Technology in aerospace engineering. His current interests are understanding and improving the gust rejection capabilities of multirotor and eVTOL configurations.

Guest Biographies



Dr. Jean-Paul Reddinger

RPI (MOVE) Alumnus

Dr. Jean-Paul Reddinger is a member of the Vehicle Applied Research Division (VARD) in the Vehicle Technology Directorate (VTD) of the U.S. Army Research Laboratory (ARL). He joined after graduating with his Ph.D. from Rensselaer Polytechnic Institute in August of 2017, where he worked on aeromechanics and redundant control behavior of large-scale compound helicopters. His work at Rensselaer led him to explore machine learning solutions to pilot-assisted control allocation of these over-actuated systems.

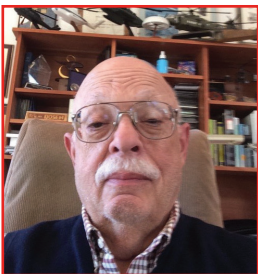
Within VTD, he is adapting his work to smaller scale autonomous UAV systems, while exploring additional machine learning and control solutions to challenges specific to reconfigurable UAV platforms at a range of scales.



Mr. Elias Rigas

eVTOL Panel Discussion Moderator

Mr. Elias Rigas serves as the U.S. Army Research Laboratory (ARL), Vehicle Technology Directorate (VTD) Chief of the Vehicle Applied Research Division. Mr. Rigas is responsible for helping to develop the tactical and strategic vision for the Vehicle Applied Research Division, VTD, ARL. Mr. Rigas works to develop collaborative relationships across the Army/Joint community, universities, and industry to help inform and align current/future technology development efforts and to transition technology/capabilities to meet soldier needs. Mr. Rigas is the recipient of the Department of the Army, Research Development and Achievement Award as well as over a dozen Department of the Army Awards. He is the author/co-author of over 40 technical papers, and reports in the areas of robotics, smart structures, and materials.



Dr. Kenneth Rosen

Advisory Council Member

Dr. Ken Rosen is founder of General Aero-Science Consultants, serving industry and government customers. He has supported DOD (DARPA TTO) on programs such as UCAR, Heliplane, the Heavy Lift Helicopter, and the DARPA VTOL X Plane. He helped prepare the Future of Vertical Lift Aviation study for the Army/DARPA, served as a member of the NRC/NASA Committee on Autonomy Research for Civil Aviation (2014), and is on the Panel on Mechanical Science and Engineering at ARL and the Board on Army Science and Technology of the National Academies. Prior to this he spent over 35 years at Sikorsky Aircraft, where he rose to VP of Research & Engineering, directing such advanced technology projects as the Comanche, S-92, Cypher (UAV), UH-60 Black Hawk, and S-76 and X-Wing helicopters. Dr. Rosen is a member of the NAE, and the Connecticut Academy of Science and Engineering, and is a Fellow of ASME, the Royal Aeronautical Society, the SAE, the AIAA, and the AHS. He was also honored with the AHS Klemin Award and the AHS Nikolsky Lectureship. He holds M.S. and Ph.D. degrees in mechanical engineering from RPI.

Guest Biographies



Dr. Vineet Sahasrabudhe
Advisory Council Member

Vineet Sahasrabudhe, Director of Engineering Sciences at Sikorsky Aircraft Corp., is responsible for oversight of Aerodynamics, Experimental Aeromechanics, Dynamics, Handling Qualities and Control Laws, Dynamic Simulation, Loads, Mass Properties, Noise, Vibration & Harshness, Thermal Management, and Survivability. Vineet joined Sikorsky in 2000 as a Handling Qualities and Control Law Engineer and has since worked on multiple programs, including RAH-66 Comanche, UH-60 Modernized Control Laws, and the Canadian Maritime Helicopter Program. He has been the Control Laws lead on CH-53K helicopter and Chief of the Handling Qualities and Control Laws group, in addition to running multiple IRAD/CRAD programs. Vineet has a Ph.D. in aerospace engineering from the University of Maryland and a Certificate in System Dynamics and Management from MIT. Dr. Sahasrabudhe is a recipient of multiple individual and team awards including the Marshall Tan Award from Sikorsky Aircraft, and the Francois-Xavier Bagnoud and Howard Hughes Awards, both from the VFS. He was named a Technical Fellow of the VFS in 2018.



Dr. Rajneesh Singh
eVTOL Panelist

Dr. Rajneesh Singh is the lead of the Vehicle Integrated Analysis team within the Vehicle Applied Research Division of the Army Research Lab's Vehicle Technology Directorate (VTD) at Aberdeen Proving Ground, MD. His team conducts research to enable highly maneuverable, high-speed, energy-efficient air vehicle platforms ranging from small Unmanned Aerial System (UAS) to heavy lift rotary wing aircraft. This includes research on Vertical Take Off and Landing (VTOL) vehicle platform mechanics, design analysis, and flight dynamics. As team lead, Dr. Singh has provided technical supervision, sought out and developed collaborations with external research partners at government labs and academia, and implemented partnerships for technology transitions.



Mr. Ken Swartz
VTOL Writer/Editor, Digital Media Specialist

Kenneth Swartz was recently elected to the Board of Directors of the Vertical Flight Society. He has been the driving force behind the Society's eVTOL News initiative since early 2017 and is a contributing editor of Vertiflite magazine. At Aeromedia Communications, Ken works with OEMs and commercial aviation companies developing market forecasts, aircraft economic models, sales and marketing campaigns, and digital media content. Ken previously worked as a Senior Market Analyst at Bombardier, developing billion-dollar marketing campaigns for the highly successful CRJ Regional Jet and Q Series Dash 8 airliners. In 2010, Ken won the Helicopter Association International's "Communicator of the Year" award. He has published more than 1,500 articles on vertical flight operators and commercial aviation over the past 30+ years and co-authored corporate histories about the four leading Canadian aerospace companies.

MOVE Faculty



Farhan Gandhi

Director, MOVE
Redfern Chair, AE
Ph.D. UMD 1995
Rotorcraft Aeromechanics, Active Rotors,
Advanced VTOL Configurations,
Multicopters



Sandipan Mishra

Assoc. Prof., ME
Ph.D. UC Berkeley 2008
Systems and Control Theory,
Learning Control



Fotis Kopsaftopolous

Assistant Prof., AE
Ph.D. U. Patras 2012
Intelligent Aero Structural Systems,
Stochastic Sys ID, Fly-by-Feel



Onkar Sahni

Assoc. Prof., AE
Ph.D. RPI 2007
CFD, Large Eddy Simulation, Flow
Separation, Dynamic Stall Control



Michael Amitay
Decker Chair, AE
D.Sc., Technion IIT 1994
Experimental Aerodynamics,
Fluid Mechanics, Flow Control



Agung Julius
Assoc. Prof., ECSE
Ph.D. U. Twente 2005
Control, Robotics, and
Automation



Catalin Picu
Professor, ME
Ph.D. Dartmouth 1995
Mechanics of Solids,
Micro and Nano Mechanics



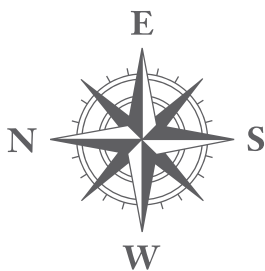
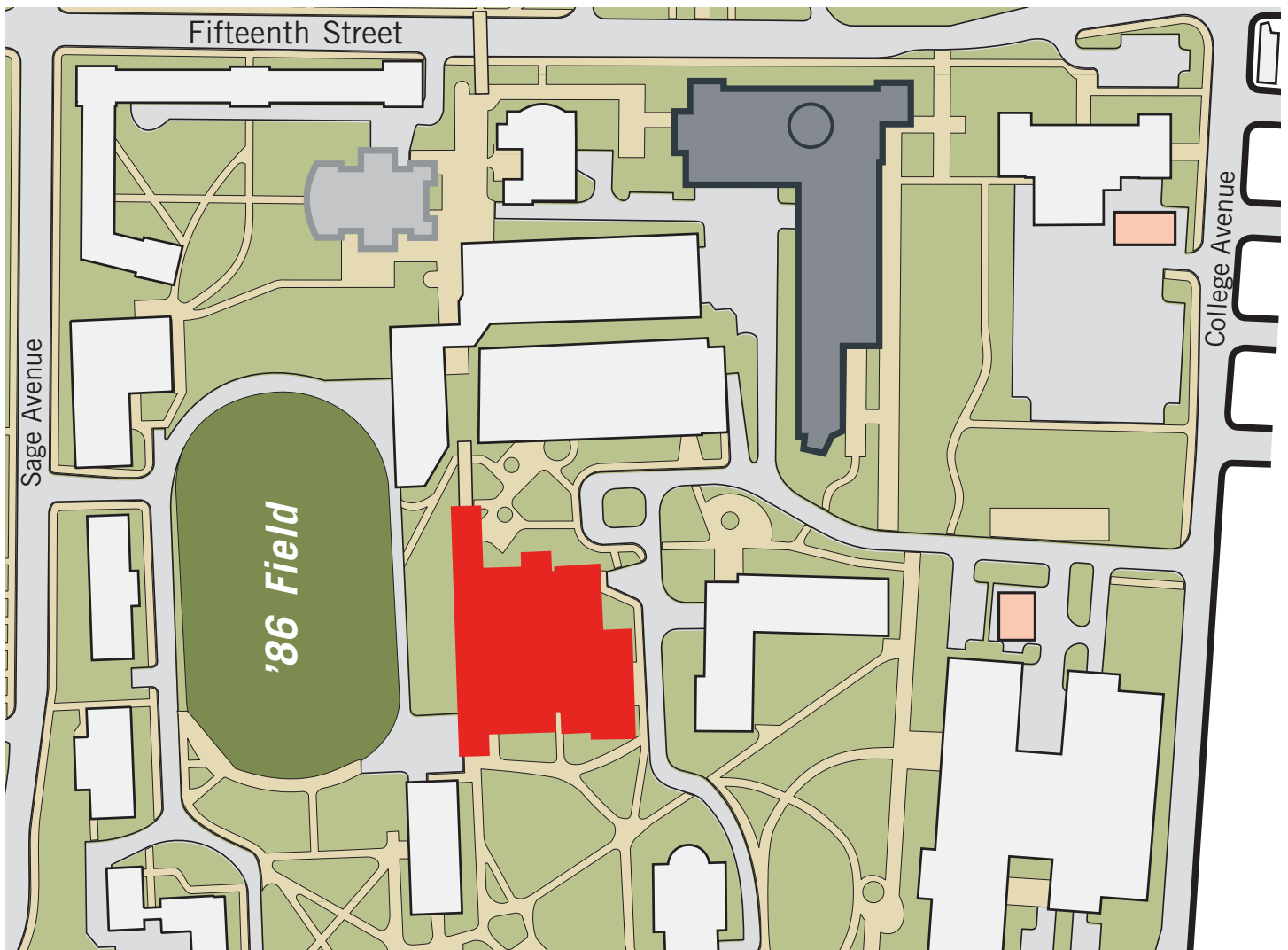
Jason Hicken
Assoc. Prof., AE
Ph.D., U. Toronto 2009
PDE Constrained Optimization,
CFD Development, Aero
Shape Optimization



Nikhil Koratkar
Clark Crossan Chair Prof., AE
Ph.D. UMD 2000
Smart Materials and
Structures, Carbon Nanotubes



Robert Niemiec
Lecturer, AE
Ph.D. RPI 2018
Aeromechanics and Flight
Dynamics of Multirotor Aircraft



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- Bruggeman Room Foyer
- Guest Parking



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