WRIK MALLIK

PhD
Department of Aerospace and Ocean Engineering
Virginia Tech
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215, Randolph Hall
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460, Old Turner Street
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RESEARCH INTERESTS

- Fluid-structure interaction (aeroelasticity)
- Unsteady aerodynamics
- Reduced order modeling
- Multidisciplinary design optimization
- Structural dynamics

EDUCATION

PhD, Aerospace and Ocean Engineering, 2016
Virginia Tech, U.S.A.
G.P.A. 3.93/4.0

B.E. Civil Engineering, 2011 (First Class with Honors)
Jadavpur University, India

RESEARCH EXPERIENCE

POST-DOCTORAL RESEARCH ASSOCIATE
June 2016 to present
Department of Aerospace and Ocean Engineering, Virginia Tech

Research projects:

- Structural and aeroservoelastic optimization for the Versatile Experimental Autonomy Research Aircraft Technology (VEARAT) in presence of strong gusts and high maneuver loads
- Reduced-order transonic flutter analysis using indicial functions

GRADUATE ASSISTANT
Fall 2011, Summer 2012-Spring 2016
Department of Aerospace and Ocean Engineering, Virginia Tech

Research projects:

- Effect of flutter on the multidisciplinary design optimization of truss-braced wing aircraft
- Aeroelastic applications of a variable geometry raked wingtip
- Transonic aeroelastic analysis for multidisciplinary design optimization applications
- Structural optimization for the Versatile Experimental Autonomy Research Aircraft Technology (VEARAT)

Advisor: Dr. Rakesh K. Kapania

SUMMER RESEARCH FELLOW
May 2010 - July 2010, IASc-INSA-NASI SRF Program
Department of Civil Engineering, Indian Institute of Technology, Bombay. India

Research project:

- Semi-active vibration control of MR dampers using recurrent neural networks

Advisor: Dr. Naresh K. Chandiramani

TEACHING EXPERIENCE

LAB INSTRUCTOR
Department of Aerospace and Ocean Engineering, Virginia Tech

- Experimental Methods (Spring 2012)

TEACHING ASSISTANT
Department of Aerospace and Ocean Engineering, Virginia Tech

- Vehicle Vibration and Control (Fall 2011)
- Advanced Aero-Hydrodynamics (Fall 2012)
- Aircraft Design II (Spring 2013)
- Vehicle Structures (Fall 2013)
- Aerospace Structures (Spring 2014)
- Aerospace Propulsion (Fall 2014)
- Elastic Stability of Structures (Spring 2015)

INVITED TALKS

Invited talk at short course on Vibration and Flutter
June 11-12, 2015
Department of Aerospace Engineering
Indian Institute of Technology, Kharagpur. India

AWARDS AND HONORS

- **Pratt Fellowship** (Fall 2012) from the Department of Aerospace and Ocean Engineering, Virginia Tech, for outstanding academic achievement as a graduate student from Fall 2011-Spring 2012
- **Indian Academy of Sciences (IASc-INSA-NASI) Summer Research Fellowship Award** in Engineering Sciences, 2010

PUBLICATIONS

JOURNAL ARTICLES

- Motra, Gokarna B., Mallik, Wrik and Chandiramani, Naresk K., "Semi-active vibration control of connected buildings using magentorheological dampers", *J. Intel Mater Syst Struct*, Vol. 22, No. 16, 2011, pp. 1811-1827

- Mallik, Wrik, Kapania, Rakesh K. and Schetz, Joseph A. , "Effect of Flutter on the Multidisciplinary Design Optimization of Truss-Braced-Wing Aircraft", *J. Aircraft*, Vol. 52, No. 6, 2015, pp. 1858-1872
- Mallik, Wrik, Kapania, Rakesh K. and Schetz, Joseph A., "Aeroelastic Applications of a Variable Geometry Raked Wingtip", *J. Aircraft*, Accepted for publication, March 31, 2016
- Mallik, Wrik, Schetz, Joseph A. and Kapania, Rakesh K., "Reduced-order Transonic Flutter Analysis for Large Aspect-ratio Wings", in preparation

CONFERENCE PROCEEDINGS

- Mallik, Wrik, Kapania, Rakesh K., and Schetz, Joseph A., "Multi-disciplinary Design Optimization of medium-range transonic truss-braced wing aircraft with flutter constraint", *54th AIAA/ ASME/ ASCE/ AHS/ ASC Structures, Structural Dynamics and Materials Conference*, AIAA 2013-1454
- Gupta, Rikin, Mallik, Wrik, Kapania, Rakesh K., and Schetz, Joseph A., "Multi-disciplinary Design Optimization of subsonic truss-braced wing cargo aircraft", *55th AIAA/ ASME/ ASCE/ AHS/ ASC Structures, Structural Dynamics and Materials Conference*, AIAA 2014-0186
- Mallik, Wrik, Kapania, Rakesh K., and Schetz, Joseph A., "Aeroelastic Analysis and Optimization of Flexible Wing Aircraft with a Novel Control Effector", *56th AIAA/ ASME/ ASCE/ AHS/ ASC Structures, Structural Dynamics and Materials Conference*, AIAA 2015-1175
- Mallik, Wrik, Kapania, Rakesh K., and Schetz, Joseph A., "Transonic Aeroelastic Analysis for Multidisciplinary Design Optimization Applications", *57th AIAA/ ASME/ ASCE/ AHS/ ASC Structures, Structural Dynamics and Materials Conference*, AIAA 2016-0237

REVIEW ACTIVITY

Reviewer for

- AIAA Journal
- Journal of Guidance, Control and Dynamics

COMPUTER SKILLS

- **Programing and Scripting Languages** - FORTRAN, C++, Shell scripting
- **Scientific Softwares** - MATLAB, NASTRAN, PATRAN, Mathematica, SU2, ZAERO, ModelCenter, SOLIDWORKS, OpenFOAM, ANSYS
- **Operating Systems** - Windows, Linux

REFERENCES

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