**Faculty and Staff Directory**

back

**Vinay Dayal**

**Email:** **vdayal@iastate.edu**

**Phone: 515-294-0720**



**Fax: 515-294-3262**

**Title(s)**

Associate Professor [AER E]

Associate Chair for ABET

Faculty Associate, Center for NDE

**Office**

2353 Howe

537 Bissell Rd

Ames, IA 50011-1096

**Information**

**Links**

* Dayal Research Page
* Personal Page
* Dayal CV-Short
* Dayal CV
* Google Citation

**Education**

**Ph.D.** Aerospace Engineering, Texas A&M University, 1987

**M.S.** Engineering Mechanics, University of Missouri-Rolla, 1983

**B.S.** Aeronautical Engineering, Indian Institute of Technology (Kanpur), 1972

**Awards and Honors**

* M. Hetenyi Award, 1991 for the best research paper in Experimental Mechanics.
* Included in MARQUIS “Who’s Who in Science and Engineering.”

**Teaching**

**Undergrad:** AerE 321 Flight Structures Analysis, AerE 423 Composite Aircraft Structures, AerE 421 Advanced Aircraft Structures, AerE 426 Aircraft Structural Design, AerE 422 Structures Lab, EM 324 Mechanics of Materials.

**Graduate:** AerE/EM 521 Airframe Analysis, AerE 569 Mechanics of Composites, AerE 522 Design with Composites, EM 525 Finite Element Analysis, EM 517 Experimental Mechanics.

**Research**

**Interest Areas:**

* Composite materials
* NDE of composites by ultrasound
* Experimental stress analysis
* Finite element analysis

**Selected Sponsored Projects:** $5.3 M total from 43 grants including 9 federal ( DoD, DOE, etc.), 2 state, 32 industry.

1. Facilitating Industry by Engineering Roadmapping and Science (FIBERS) to Advance US Manufacturing of Composites, with Matt Frank (IMSE), NIST, $58,000,
2. Composite Standards Calibration Kit for Interchangeable use in NDE, Innoveyda/US Airforce, May 2014-Nov.2014, $48,805.
3. Innovative Offshore Vertical-Axis Wind Turbine Rotor, with Matt Frank (PI), Frank Peters (IMSE) and John Jackman (IMSE), Jan 2009-Aug. 2016, $101,899.
4. NDE Research on Wind Turbine Blades, State of Iowa/TPI, with Dan Barnard (CNDE), Jan 2013-Dec 2013, $39,927.
5. NDE of Body Armor, US Army, with Dave Hsu (CNDE), July 2008-Sept 2010, $135,692.
6. Redesign of a Composite Helmet, inVince Safety Systems, Jan 2014-June 2015, $101,899.
7. AMII- Ultrasonic Evaluation of Wind Blades to improve Reliability and Productivity, with Matt Frank (IMSE), France Peters (IMSE) and John Jackman (IMSE), July 2009-June 2012, $1,053,000
8. Design and Analysis of a Typical Fireplace, Hearth & Homes Tech, Jan 2008-Jan 2009, $45,165
9. Extreme Winds Near Ground and Their Damaging Effects on the Built Environment, from NOAA, with PI:PP Sarkar, Haan, Hu, Gallus, Takle, $923,241
10. Development of Air-Coupled Inspection for Carbon Composite Wing Spar, from FAA, with Dave Hsu (CNDE), Jan 2006-Dec 2006, $145,000.

**Selected Publications: (of 147 pubs. including 36 journals, 4 book chapters, 4 patents; h-index (Google): 14)**

1. Livings, R., **Dayal, V.**, Barnard, D. Air-Coupled Ultrasonic Resonance Imaging of Hexagonal SiC and Alumina Tiles, *Journal of Nondestructive Evaluation*, Vol. 36: 15(1).
2. Livings, R., **Dayal, V.**, Barnard, D. (2016). “Damage Detection in a Multi-Layered, Multi-Material Composite Using Air-Coupled Ultrasonic Resonance Imaging,” *Journal of Nondestructive Evaluation*, Vol. 35.
3. Chakrapani, S.K., Barnard, D., **Dayal, V.** “Influence of Laminate Sequence and Fabric Type on the Inherent Acoustic Nonlinearity in Carbon Fiber Reinforced Composites,” *Journal of the Acoustical Society of America*, Vol. 139(5), pp. 2310-2319.
4. Chakrapani, S.K., Barnard, D., **Dayal, V.** (April 2016). “Nonlinear forced vibration of carbon fiber/epoxy prepreg composite beams: Theory and experiment,” *Composites Part B*, Vol. 91, pp. 513-521.
5. Chakrapani, S.K., Barnard, D., **Dayal, V.** (Sept. 2015). “Finite element simulation of core inspection in helicopter rotor blades using guided waves,” *Ultrasonics*, Vol. 62, pp. 126-135.
6. **Dayal, V.** (Oct. 2009). “Conceptual design of unpressurized shelters on lunar surface,” *Journal of Aerospace Engineering*, 22(4), pp. 396-402.
7. Kumar, N., **Dayal, V.**, Sarkar, P.P. (June 2012). “Failure of wood-framed low-rise building under tornado wind loads,” *Engineering Structures*, 39, pp. 79-88.
8. **Dayal, V.** (2014). “Conceptual design of pressurized shelters on the lunar surface,” *Journal of Aerospace Engineering*, 27(1), pp. 33-39.
9. **Dayal, V.**, Hsu, D.K., Kite, A.H. (2007). “Air-coupled ultrasound – a new paradigm in NDE,” *Proctor of the Mechanical Engineering Congress and Exposition*, Nov. 11-15, Seattle, WA.
10. **Dayal, V.** (1992). “An automated simultaneous measurement of thickness and wave speed by ultrasound,” *Experimental Mechanics*, 32(3), pp. 197-202.
11. Hsu, D.K., **Dayal, V.** (1998). “Ultrasonic Newton’s Rings,” *Applied Physics Letters*, 60(10), pp. 1169-1171.
12. **Dayal, V.** (1998). “Fourier transformation for non-destructive evaluation,” *Journal of the Acoustical Society of America*, 104(3), pp. 1789.
13. Mohammed, I., **Dayal, V.** (1994). “Micro-macro crack interaction in composites,” *Engineering Fracture Mechanics*, 49(5), pp. 647-659.