

**Dr. Pankaj Kumar Porwal**

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**PERSONAL DETAILS**

Date of Birth: 25/03/1979

Gender: Male

Nationality: INDIAN

Marital Status: Married

**QUALIFICATIONS**

**Cornell University, Ithaca, NY (USA)**

**Degree: PhD**

**October 2006**  
**(January 2007)**

**Major:** Theoretical & Applied Mechanics

**(GPA:**

**3.84/4.0)**

**Minor:** Probability and Statistics (Applied Mathematics)

**Thesis:** Statistical and Impact Strengths of Fibrous Structures: Monte Carlo Simulation and Analytical Modeling

**Advisor:** Prof. S. Leigh Phoenix

**Indian Institute of Technology, Bombay (India)**

**Degree: B.Tech.**

**August 2001**

**Major:** Civil Engineering

**(GPA: 9.05/10.00)**

**Thesis:** Application of Artificial Neural Network in Prediction of Earthquake Ground Motion Parameters

**Advisor:** Prof. Pradipta Banerji

**AWARDS / HONORS**

- **Dainik Bhaskar Best Teacher Award (Udaipur)** 2009
- **Best Presentation Award (Cornell Postdoctoral Research Day)** 2007
- **Los Alamos Distinguished Student Award** 2004  
(Los Alamos National Lab, NM)
- **Cornell Fellow (Cornell University, Ithaca, NY)** 2001-2002
- **Vinod Lal Memorial Prize** 2001  
(Second rank, Civil Engineering, IIT, Bombay, India)
- **K.C. Mahindra Scholarship for Post-Graduate Studies Abroad** 2001
- **Sir Ratan Tata Travel Grant for Higher Studies Abroad** 2001
- **Institute Scholarship (IIT, Bombay, India)** 1998-2001

**WORK / TEACHING / RESEARCH EXPERIENCE**

<b>Professor &amp; Principal</b>	<b>2011-present</b>
<b>Associate Professor</b>	<b>2010-2011</b>

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Civil Engineering Department, Techno India NJR Institute of Technology, Udaipur

<b>Assistant Professor,</b>	<b>2007-2009</b>
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Civil Engineering Department, IIT Bombay, Powai, Mumbai (INDIA)

Postdoctoral Associate, Cornell University, Ithaca, NY USA	2006-
2007	

Internship, Los Alamos National Lab, New Mexico, USA	2004-
2005	

Graduate Research Assistant, Cornell University	2002-2004, 2005-2006
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**TEACHING EXPERIENCE**


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**Techno India NJR Institute of Technology, Udaipur**

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|-------------------------------------|------------------------|
| • Engineering Mechanics             | 2010, 2011             |
| • Statistics and Probability Theory | 2011, 2012             |
| • Optimization Techniques           | 2011                   |
| • Mechanics of Solids               | 2012                   |
| • Quantity Surveying in Valuation   | 2013                   |
| • Theory of Structures I            | 2014, 2015, 2017, 2019 |
| • Theory of Structures II           | 2014                   |
| • Design of Concrete Structures I   | 2016, 2017, 2018       |
| • Design of Concrete Structures Lab | 2016                   |

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**Assistant Professor, IIT Bombay**

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|---|--------------------------|
| • Concrete Technology (CE 484, Course Coordinator)    | Spring 2008              |
| • Solid Mechanics (CE201)                             | Autumn 2007, Autumn 2008 |
| • Reliability Based Civil Engineering Design (CE 622) | Spring 2008              |
| • Engineering Mechanics (CE102) (Tutor)               | Spring 2008              |

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**Teaching Assistant, Cornell University**

- |   |             |
|---|-------------|
| • Advanced Engineering Analysis (TAM 310) | Fall 2006   |
| • Dynamics (TAM 203)                      | Spring 2003 |

- Mechanics of Solids (TAM 202) Fall 2002
- Engineering Mathematics (MATH 293) Summer 2002

### **Continuing Education Program (CEP) Courses Conducted, IIT Bombay**

#### **Mechanics of Solids (Summer 2008)**

Conducted a week long CEP course, along with Prof. Deepankar Choudhury, for teachers of Engineering Colleges and Polytechnics affiliated to Gujarat Technological University.

#### **Finite Element Method & Applications in Civil Engineering (Summer 2008)**

Organized by Prof. T I Eldho and Y M Desai

Delivered a lecture on introduction to Abaqus.

### **INTERNATIONAL JOURNAL/BOOK CHAPTER PUBLICATIONS**

S. Leigh Phoenix, A. Kadir Yavuz, **Pankaj K. Porwal** (2010) “New interference approach for ballistic impact into stacked flexible composite body armor” *AIAA Journal* **48**(2),490-501

I J Beyerlein, **Pankaj K. Porwal**, Y T Zhu, K Hu and X F Xu (2009) “Scale and twist effects on the strength of nanostructured yarns and reinforced composites.” *Nanotechnology* 20.

Irene J. Beyerlein, **Pankaj K. Porwal**, Yuntian T. Zhu, X. Frank Xu, and S. Leigh Phoenix (2009) “Probabilistic Strength of Carbon Nanotube Yarns.” Book Chapter in *Advances in Mathematical Modeling and Experimental Methods for Materials and Structures*, The Jacob Aboudi Volume, Series: Solid Mechanics and Its Applications, Vol. 168. Editors: Gilat, Rivka; Banks-Sills, Leslie, 2009, IV, 296 p., Springer. Hardcover. ISBN: 978-90-481-3466-3

**Pankaj K. Porwal** and S. Leigh Phoenix. (2008) “Effects of layer stacking order on  $V_{50}$  velocity of multi-layered hybrid armor systems.” *Journal of Mechanics of Materials and Structures*, **3**(4), 627-639.

**Pankaj K. Porwal** and C.-Y. Hui. (2008) “Strength statistics of adhesive contact between a fibrillar structure and a rough substrate.” *Journal of The Royal Society Interface*, **5**(21), 441-448.

**Pankaj K. Porwal**, Irene J. Beyerlein and S. Leigh Phoenix. (2007). “Statistical Strength of Twisted Fiber Bundles with Load Sharing Controlled by Frictional Length Scales.” *Journal of Mechanics of Materials and Structures*, **2**(4), 773-791.

**Pankaj K. Porwal**, Irene J. Beyerlein and S. Leigh Phoenix. (2006). “Statistical Strength of a Twisted Fiber Bundle: An Extension of Daniels’ Equal-Load-Sharing Parallel Bundle Theory.” *Journal of Mechanics of Materials and Structures*, **1** (8), 1425-1447.

**Pankaj K. Porwal** and S. Leigh Phoenix. (2005). “Modeling of System Effects in Ballistic Impact into Multi-Layered Fibrous Structures for Soft Body Armors.” *International Journal of Fracture*, **135** (1-4), 219-251.

S. Leigh Phoenix and **Pankaj K. Porwal**. (2003). “A New Membrane Model for the Ballistic Impact Response and V50 Performance of Multi-ply Fibrous System.” *International Journal of Solids and Structures*, **40**, 6723-6765.

### **NATIONAL JOURNAL/CONFERENCES/WORKSHOPS**

**Pankaj K. Porwal** (2011). “Strength Statistics of Frictionless Carbon Nanotube Yarns.” *Proceedings of All India Seminar on “Advances in Manufacturing Technologies and Challenges of the Decade Ahead (AMTCDA-2011), organized by Department of Mechanical Engineering, College of Technology and Engineering, MPUAT, Udaipur, 1-5*

**P. Porwal** (2013) “Statistical aspects in mechanics of fibrillar adhesives” *National seminar on “New composites: the materials for chemical and allied industries” organized by The Institution of Engineers (India), Udaipur Local Centre, October 4-5, 2013.*

*R.N. Raikar Memorial International Conference and Dr. Suru Shah Symposium on Advances in Science & Technology of Concrete, December 20-21, 2013, Mumbai (India)*

**Pankaj Kumar Porwal** (2014) “Walking on the ceiling with fibrillar nano-adhesives” *Two days national workshop on Enhancing Material Properties by Nanotechnology, College of Technology and Engineering under TEQIP-II, February 7-8, 2014.*

*2<sup>nd</sup> International Conference on Transformations in Engineering Education (IUCEE), January 5-8, 2015, Bangalore*

*The 19<sup>th</sup> CEO Conference on “Make in India: Global Business Opportunities”, Indian Institution of Industrial Engineering, October 08-11, 2015, Dubai (UAE)*

**Pankaj Kumar Porwal**, “Role of Structural Engineers in Mitigating Vulnerabilities to Earthquake” *One day workshop on Disaster Mitigation organized Institution of Engineers (India), June 18, 2016, Udaipur Local Center*

**Pankaj Kumar Porwal**, “Role of Structural Engineers in Mitigating Vulnerabilities to Earthquake” *One day workshop on Earthquake Resistant Structures organized by Ambuja Cement Foundation, December 30, 2016, Udaipur*

*4<sup>th</sup> International Conference on Transformations in Engineering Education (IUCEE), January 11-12, 2017, Jaipur.*

Lokesh Puri Goswami, Harshit Jaroli, Sachin Goya, **Pankaj Kumar Porwal**, “Low-cost construction materials using marble slurry, waste plastic and sand”, *International Civil Engineering Symposium, 2018 IIT Mumbai.*

**Pankaj Kumar Porwal**, Kunjpreet Kaur, Nikhil Kumawat, Ishika Sharma, Divyansu Sharma, Jayesh Nagada, “Low cost and high quality bricks and paver blocks using only waste materials”, *National Conference on Pollution Control Technologies and Sustainable Development, October 2019, MNIT, Jaipur.*

### **SIGNIFICANT RESEARCH PROPOSAL/GRANT**

Coauthored a grant proposal with S. Leigh Phoenix (Professor, Cornell University, Principle Investigator) which was funded by **U.S. Department of Justice** through **National Institute of Justice**.

Budget: The total budget over two year period (2008-2009) was **US\$ 5,27,546**.

Title: “Design Optimization of Integrated Multi-Ply Armors by a Computational Tool (DO-IMPACT)”

The primary goal of the research was to develop a user-friendly computational tool for design optimization of body armor at all levels of integration, i.e., from filament to yarn, yarn to fabric layer, and integration of layers with varying properties into multi-Ply armor system.

## **CONFERENCES/WORKSHOPS ORGANIZED**

Organized an Industry/Academia Seminar On Challenges and Opportunities in Concrete at IIT Bombay (2008)

Workshop on Introduction to Research Methodology (Remote Center Coordinator for workshop conducted by IIT Bombay through AView) (25/06/2012 to 04/07/2012)

International Workshop on Innovative Manufacturing Practices in Automotive and Tyre Industry (in association with Institution of Engineers and JK Tyre Kankroli) (2013)

International Workshop on Cementing the Future: Vision for Cement Manufacturing in Rajasthan (in association with Indian Concrete Institute, Jaipur) (2014)

2 Week ISTE STTP on Introduction to Design of Algorithms (Remote Center Coordinator for workshop conducted by IIT Kharagpur through AView) (27/04/2015 to 30/05/2015)

## **Educational Videos on YouTube**

Created more than 300 education videos on YouTube in following areas

1. Machine Learning, Reinforcement Learning, Deep Learning, Artificial Intelligence, Recommendation Systems, ANNs, CNNs
2. GATE Mathematics (Linear Algebra, Complex Variables, Vector Spaces and Properties Probability,
3. Theory of Structures (Column Analogy Method, Slope Deflection Method, Conjugate Beam Method, Influence Line Diagram, Matrix Method, Moment Distribution Method, Conjugate Beam Method, Theorem of Three Moments

## **MTech PROJECT GUIDANCE WORK**

### **MTech Projects (at IIT Bombay)**

Imran D. Pathan (07304803): Modeled effects of blast loading on structures using finite element software.

### **Dual Degree (MTech) Projects (at IIT Bombay)**

Prashant Khandelwal (04D04007): Studied properties of concrete where waste materials, like tire rubber pieces, concrete waste from demolished building, glass and plastic bottles etc., replace part of conventional aggregates.

Ankur Rathor (04D04002): Performed Monte Carlo simulations to understand the statistical aspects in strength of fibrillar adhesives.

### **Start Up - Mentorship Role**

Mentoring a student startup Wricks for last 3 years which has achieved several significant mile stones.

- 1<sup>st</sup> Prize of Rs 15 Lakhs in Rajasthan Digifest (Bikaner) Greenathon (2018)
- Awarded Grant of Rs 10 Lakh by AICTE to implement project that won 2<sup>nd</sup> Prize at Smart India Hackathon 2018 at NIT Trichy (2019)
- Won Prize Grant of Rs 5 Lakhs at Carbon Zero Challenge by IIT Madras (2019)
- Grant of Rs 4.5 Lakhs awarded by Eco Grants (PVRnest) to develop project (2019)
- 2<sup>nd</sup> Prize of Rs 75 Thousand at Smart India Hakathon 2018 at NIT Trichy
- Best Presentation Award at International Civil Engineering Symposium, Civil Engineering, IIT Bombay (2018)
- Incubation Support by IIM Udaipur through Launch and Zoom 2.0 (2020)

### **PROFESSIONAL WORKSHOPS ATTENDED**

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|--|---|
| • <b>Academic Leadership Workshop Level I</b><br>Conducted by Wipro Mission10X in Delhi                    | September 25-28,<br>2011                                    |
| • <b>Academic Leadership Workshop Level II</b><br>Conducted by Wipro Mission 10X through Webinars on WebEx | Nov-Dec 2011  |
| • <b>Advanced Academic Leadership Workshop</b><br>Conducted by Wipro Mission10X in Bangalore               | April 22-25, 2012   |
| • <b>Academic Leadership Program (UKIERI and AICTE)</b>  |   |
| Workshop I (AICTE Delhi)   | - 28 <sup>th</sup> June - 30 <sup>th</sup> June, 2017       |
| Workshop II (CVRCE, Bhubaneshwar)  | - 31 <sup>st</sup> July – 2 <sup>nd</sup> August, 2017      |
| Workshop III (SKIT Jaipur)   | - 4 <sup>th</sup> October – 7 <sup>th</sup> October, 2017   |
| Workshop IV (SPCE, Mumbai)   | - 12 <sup>th</sup> January – 14 <sup>th</sup> January, 2018 |
| Study tour to <b>United Kingdom</b>  | - 1 <sup>st</sup> April – 6 <sup>th</sup> April, 2019       |

### **MEMBERSHIP OF PROFESSIONAL BODIES**

Fellow, Institution of Valuers, India

Member, Institution of Engineers (I)

Senior Member, Indian Institute of Industrial Engineering

Member, Computer Society of India

### **Administrative Responsibilities**

1. Principal, Techno India NJR Institute of Technology, Udaipur
2. Center Superintendent, Main University Exam, Rajasthan Technical University, Kota
3. Chairman, Management Committee, Techno NJR College of Professional Education
4. In charge, University Affiliation Work, RTU Kota
5. In charge, AICTE Approval Work