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## Manoj Kumar

### Education

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2011- 2017 (Expected)	PhD, Neuroscience, University of Illinois at Urbana-Champaign, Urbana-Champaign, IL.
1996 - 1999	M. S. Engineering and Applied Science, Yale University, New Haven, CT.
1995-1996	Attended University of Houston, Houston TX for a year (transferred to Yale).
1988 - 1992	B. Tech. Mechanical Engineering, IIT BHU (formerly ITBHU), Varanasi, India.

### Skills

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Methods	<i>Neuroscience related:</i> fMRI, Multi-Voxel Pattern Analysis, Signal Processing, EEG and ERPs, Machine Learning, Computer Vision, Bayesian Statistics, Research Methods Best Practices, Deep Learning
Software	<i>Neuroscience related:</i> Matlab, R, Python, Psychtoolbox, AFNI, Freesurfer, Kutas Lab ERP Pipeline, Caffe  <i>Other:</i> Mathematica, SQL, Project Management, Oracle Databases, HP and Mercury Testing tools, Enterprise Software Applications

### Research Experience: Neuroscience

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2011 – Current	<b>Graduate Student, Attention, Perception and Awareness Laboratory, University of Illinois at Urbana-Champaign, Urbana, IL</b>  Thesis: The Influence of Semantics on the Visual Processing of Natural Scenes  Advisors: Dr. Diane M. Beck and Dr. Kara D. Federmeier  Committee Members: Dr. Gabriele Gratton, Dr. Oluwasanmi Koyejo and Dr. Fei-Fei Li
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2009 - 2011 **Visitor, Vestibular and Oculomotor Laboratory, University of Michigan, Ann Arbor, MI** PI: Dr. William King.

My first foray into Neuroscience. Moonlighted and programmed experiments to study visual smooth pursuit eye movements under head free conditions.

### **Research Experience: Engineering**

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1997 - 1998 **Research Assistant, Yale University, New Haven, CT.**

1993 - 1995 **Research Fellow, National Aerospace Laboratories**

Computational and Theoretical Fluid Dynamics Division, Bangalore, India

### **Industry Experience: Software Consulting**

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2001 – 2011 Computer Sciences Corporation/ (Covansys), MI.

2000 - 2001 Youngsoft Inc, MI.

Summary of my Industry Experience I took on diverse roles in these organizations with increasing levels of responsibility, starting as a technical software developer and going on to senior leadership roles. I led large team on multiple projects, distributed across continents, while implementing software solutions for clients – from gathering requirements to production rollouts. Mentored team members and helped nurture team work, collaboration and excellence. Demonstrated expertise in technical software development, project management, risk mitigation, change management and troubleshooting skills, and automated software testing.

### **Talks**

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2016 Guest Lecture, Neuroscience I Core Course, University of Illinois at Urbana-Champaign.

Cognitive Neuroscience Brown Bag, Dept. of Psychology, University of Illinois at Urbana-Champaign.

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Center for Neural Science, Indian Institute of Science, Bangalore, India.

- 2015 Guest Lecture, Neuroscience I Core Course, University of Illinois at Urbana-Champaign.
- Kumar, M., Zhang, Y., Beck, D. M., and Federmeier, K. D., 2015 “The good, the bad and the early: top-down influence on scene categorization”, Oral Presentation at the Society for Neuroscience Annual Meeting, Chicago, IL.
- Spring Seminar Series, Neuroscience Program, University of Illinois at Urbana-Champaign.
- Cognitive Brown Bag, Dept. of Psychology, University of Illinois at Urbana-Champaign.
- Visual Cognition and Human Performance Brown Bag, Dept. of Psychology, University of Illinois at Urbana-Champaign.
- 2014 Kumar, M., Federmeier, K. D, Fei-Fei, L. and Beck, D. M., 2014 “Visual and Semantic Similarities Across Pictures and Words”, Oral Presentation at the Vision Sciences Society Meeting, St. Petersburg, FL.
- Cognitive Neuroscience Brown Bag, Dept. of Psychology, University of Illinois at Urbana-Champaign.
- 2013 Visual Cognition and Human Performance Brown Bag, Dept. of Psychology, University of Illinois at Urbana-Champaign.
- Neuroscience Seminar, University of Illinois at Urbana-Champaign.
- Vision Lab Meeting, Center for Neural Science, Indian Institute of Science, Bangalore, India.
- 2012 Neuro-Engineering IGERT Meeting, University of Illinois at Urbana-Champaign.
- 1995 Manoj Kumar and Shankar, P.N., 1995 “A New Vortex Ring Translational Instability” Oral Presentation at the 6th Asian Congress of Fluid Mechanics, Singapore.

## Manuscripts in Preparation

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Kumar, M., Zhang, Y., Beck, D. M., and Federmeier, K. D., (in prep), “Learned Statistical Regularities Facilitate the Processing of Good Exemplars”.

Dickson, D., Kumar M., Laszlo, S., Beck, D.M and Federmeier K. D. (in prep), “Multivoxel pattern analysis reveals the processing abilities of the (left) Visual Word Form Area and its right hemisphere counterpart”.

## Publications

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### Cognitive Neuroscience

Kumar M., Federmeier K. D., Fei-Fei, L. and Beck, D.M (in press), “Evidence For Similar Patterns of Neural Activity Elicited by Picture- and Word-based Representations of Natural Scenes”, *NeuroImage*.

### Engineering

Shankar, P.N. and Manoj Kumar, 1995 “Vortex Rings Generated by Drops Just Coalescing With A Pool”, *Physics of Fluids* 7, p. 737.

Manoj Kumar, Arakeri J.H. and Shankar, P.N., 1995 “A Note On Translational Velocity Oscillations Of Piston Generated Vortex Rings”, *Physics of Fluids* 7, p. 2751.

Shankar, P.N. and Manoj Kumar, 1994 “Experimental Determination of the Kinematic Viscosities of Glycerol Water Mixtures”, *Proceedings of the Royal Society London A* 444, p. 573.

Shankar, P.N. and Manoj Kumar, 1994 “Toroidal Vortex Rings”, *Current Science* 66, p. 151.

Manoj Kumar and Shankar, P.N., 1993 “The Kinematic Viscosities of Ethylene Glycol and Castor Oil”, *Current Science* 65, p. 983.

## Conference Abstracts

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Kumar, M., Zhang, S., and Beck, D. M., 2017 “Similarities Between Deep Neural Networks and Brain Regions In Processing Good and Bad Exemplars of Natural Scenes”, Vision Sciences Society Meeting, St. Petersburg, FL.

Kumar, M., Zhang, Y., Beck, D. M., and Federmeier, K. D., 2017 “It's the Right Cue: Hemispheric Differences in Predictive Processing of Natural Scenes”, Cognitive Neuroscience Society, San Francisco, CA.

Kumar, M., Federmeier, K. D, Fei-Fei, L. and Beck, D. M., 2016 “The neural semantic representations of fine-grained object categories”, Society for Neuroscience Annual Meeting, San Diego, CA.

Kumar, M., Federmeier, K. D, Fei-Fei, L. and Beck, D. M., 2016 “Visual and Semantic Neural Representations For Animate and Inanimate Objects”, Vision Sciences Society Meeting, St. Petersburg, FL.

Kumar, M., Zhang, Y., Beck, D. M., and Federmeier, K. D., 2015 “The good, the bad and the early: top-down influence on scene categorization”, Oral Presentation at the Society for Neuroscience Annual Meeting, Chicago, IL.

Kumar, M., Zhang, Y., Beck, D. M., and Federmeier, K. D., 2015 “Scene Categorization: The Good, The Bad And The Early”, Society for Psychophysiological Research Annual Meeting, Seattle, WA.

Kumar, M., Zhang, Y., Beck, D. M., and Federmeier, K. D., 2015 “Scene Categorization: The Good, The Bad And The Early”, Cognitive Neuroscience Society, San Francisco, CA.

Kumar, M., Zhang, Y., Beck, D. M., and Federmeier, K. D., 2015 “Scene Categorization: The Good, The Bad And The Early”, Vision Sciences Society Meeting, St. Petersburg, FL.

Kumar, M., Federmeier, K. D, Fei-Fei, L. and Beck, D. M., 2014 “Evidence For A Common Semantic Representation For Pictures And Words”, Cognitive Neuroscience Society, Boston, MA.

Kumar, M., Fei-Fei, L. and Beck, D. M., 2013 “Frontal Contributions to Natural Scene Processing”, Vision Sciences Society Meeting, Naples, FL.

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### **Peer Review Extended Conference Abstracts**

Marc Massot, Manoj Kumar, Smooke M.D. and Gomez A., 1998 “Spray Counter Flow Diffusion Flames of Heptane: Experiments and Computations with Detailed Kinetics and Transport”, Twenty Seventh Symposium (International) on Combustion, p. 1975.

Manoj Kumar and Shankar, P.N., 1995 “A New Vortex Ring Translational Instability”, Proceedings of the 6th Asian Congress of Fluid Mechanics, p. 1576.

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### **Awards/ Achievements**

2011 - 2013 NSF Neuro-Engineering IGERT Fellowship.

1996 - 1997 Yale University Graduate Student Fellowship.

1988 Qualified for admission to the Indian Institute of Technology (IIT). Only the top 2% of candidates for the IIT Entrance Examination were eligible for qualification.

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### **Teaching**

2014 Spring Primary Instructor, PSYC 100 Introduction to Psychology  
Responsible for teaching all lectures, making assignments and all grading.

2013 Fall Primary Instructor, PSYC 100 Introduction to Psychology  
Responsible for teaching all lectures, making assignments and all grading.

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### **Service at the University of Illinois at Urbana-Champaign**

2013 Mentor to undergraduate students as a part of ISNI 2013.

Host for the 2013 Neuroscience Program Open House

2012 One of two organizing members for SFN Night, a Neuroscience Program Event at Illinois.

One of four organizing committee members for the 2012 UIUC Neuro-Engineering

IGERT symposium.

Independently organized a visit by Prof. Thomas Mitchell for the Neuro-Engineering seminar series.

Host for the 2012 Neuroscience Program Open House.

## References

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### **Diane M. Beck**

Associate Professor  
University of Illinois, Department of Psychology  
603 E. Daniel St., Room 531 Psychology Building  
Champaign, IL 61820  
dmbeck@illinois.edu

### **Kara D. Federmeier**

Professor  
University of Illinois, Department of Psychology  
603 E. Daniel St., Room Psychology Building  
Champaign, IL 61820  
kfederme@illinois.edu

### **Li Fei-Fei**

Associate Professor  
Stanford University, Department of Computer Science  
353 Serra Mall, Room 246  
Stanford, CA 94305  
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