

# Parneet Kaur

Computer Vision Researcher

<http://parneetk.github.io/>

## Education

- Oct. 2017 **Ph.D. Candidate, Electrical and Computer Engineering**, *GPA: 3.79/4.0.*  
Rutgers University, Piscataway, NJ  
Thesis: Computational Appearance Models for Quantitative Dermatology  
Advisor: Dr. Kristin J. Dana
- 2013 **M.S., Electrical and Computer Engineering**, *GPA: 3.75/4.0.*  
Rutgers University, Piscataway, NJ  
Thesis: Automated bridge deck evaluation from ground penetrating radar scans  
Advisor: Dr. Kristin J. Dana
- 2007 **B.E., Electronics and Communication Engineering**, *Aggregate: 81%.*  
Visvesvaraya Technological University, Bangalore, India

## Experience

- Feb 2018 – present **Postdoctoral Scientist**, *Johnson & Johnson, Skillman, NJ.*  
◦ Developing deep learning methods for better understanding and computational analysis of skin and facial appearance.
- July 2017 – Oct 2017 **Student Associate**, *Vision and Learning Group, SRI International, Princeton, NJ.*  
◦ Developed webly and weakly-supervised learning methods for image classification and object localization.
- Oct 2011 – Oct 2017 **Graduate Assistant**, *Computer Vision Lab, Rutgers University, NJ.*  
**Style transfer**  
◦ Developed texture transfer technique for facial images using deep learning.  
**Deep Learning for Skin Analysis**  
◦ Collaborated with Johnson & Johnson to develop computational models linking skin appearance and skin microbiome using multi-modal skin imaging and sparse coding.  
◦ Developed hybrid deep learning method for automated classification of macroscopic and microscopic skin images.  
◦ Developed multi-view clustering technique for heterogeneous datasets.  
**Rebar Analysis for Robotic Bridge Deck Evaluation**  
◦ Analyzed ground penetrating radar (GPR) scans to generate bridge deck deterioration maps using Robotic Assessment Bridge Inspection Tool in collaboration with Federal Highway Administration.  
◦ Integrated machine learning classification using image-based gradient features and robust curve fitting of the rebar hyperbolic signature to locate rebars in the GPR images.
- May 2016 – Aug 2016 **Student Associate**, *Vision Systems Group, SRI International, Princeton, NJ.*  
◦ Analyzed skin texture from smart-phone and specialized cameras for a major cosmetic company.  
◦ Evaluated pre-trained convolutional neural networks (CNNs) as feature extractors, trained and fine-tuned CNNs by augmenting skin datasets.  
◦ Compared existing techniques for melanoma lesion classification
- Fall 2016 **Teaching Assistant**, *Department of Electrical and Computer Engineering, Rutgers University, NJ.*  
Summer 2013 ◦ *Robotics & Vision*: Held TA office hours, graded assignments and projects. (40 students).  
Spring 2012 ◦ *Programming Methodology I Lab*: Instructed, designed and graded programming assignments (15+ students).  
◦ *Software Engineering*: Oversaw 12 semester-long projects, graded exams and project reports (70+ students).
- Jun 2011 – Sep 2011 **Intern**, *Broadcom Corporation, Yardley, PA.*  
◦ Developed a software prototype for video stabilization in high-definition televisions.  
◦ Implemented visualization of various motion vector fields.

- Oct 2007 – **Software Engineer**, *Robert Bosch Engineering and Business Solutions Limited*, Bangalore, India.  
Sep 2009
- Developed software for real-time embedded systems deployed in automobile platforms.
  - Conducted requirements analysis, software design and implementation, unit and integration testing, and software peer reviews.

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## Technical Skills

**Programming Languages:** Python, MATLAB, C++

**Libraries/Tools:** Pytorch, Tensorflow, keras, Caffe, MatConvNet, OpenCV, scikit-learn, VLFeat

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## Graduate Coursework

Machine Vision, Advanced Computer Vision, Machine Learning, Pattern Recognition, Convex Optimization, Regression Analysis, Digital Signals and Filters, Optimum Signal Processing, Stochastic Signals & Systems, Computer Architecture

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## Publications

- P. Kaur, K. Sikka and A. Divakaran. "Combining Weakly and Weakly Supervised Learning for Classifying Food Images." arXiv preprint arXiv:1712.08730 (2017)
- P. Kaur, H. Zhang and K. J. Dana, "Photo-realistic Facial Texture Transfer." arXiv preprint rxiv.1706.04306 (2017)
- P. Kaur, K. J. Dana and G. O. Cula, "Deep Learning for Skin Classification". [Manuscript prepared]
- P. Kaur, K. J. Dana and G. O. Cula, "Appearance-driven Multiview Co-clustering". [Manuscript prepared]
- P. Kaur, K. J. Dana, G. O. Cula and C. Mack, "Hybrid Deep Learning for Reflectance Confocal Microscopy Skin Images," 2016 23rd International Conference on Pattern Recognition, 2016.
- P. Kaur, K. J. Dana and G. O. Cula, "From photography to microbiology: Eigenbiome models for skin appearance," 2015 IEEE Conference on Computer Vision and Pattern Recognition Workshops (CVPRW), Boston, MA, 2015, pp. 1-10.
- P. Kaur, K. J. Dana, F. A. Romero and N. Gucunski, "Automated GPR Rebar Analysis for Robotic Bridge Deck Evaluation," in IEEE Transactions on Cybernetics, vol. 46, no. 10, pp. 2265-2276, Oct. 2016.

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## Posters

- P. Kaur, K. J. Dana, G. O. Cula. *Computational models to link skin appearance and skin microbiome*. Women in Computer Vision Workshop, IEEE conference on Computer Vision and Pattern Recognition (CVPRW). (Jun 2016)
- P. Kaur, K. J. Dana, F. A. Romero, N. Gucunski. *Computer vision for automated bridge deck evaluation from Ground Penetrating Radar Scans*. 3rd GNY Area Multimedia and Vision Meeting, The City College of New York, New York, USA. (Jun 2013)
- P. Kaur, P. Prasanna, K. J. Dana. *Applications of Computer Vision in Civil Engineering*. First Multimedia and Vision Meeting for the Greater New York area, Stevens Institute of Technology New York, USA. (Feb 2012)
- P. Kaur, P. Prasanna, K. J. Dana. *Real Time Hand Gesture Recognition and Blink Detection*. Rutgers Day-2010 (with demonstration). (Apr 2011)

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## Awards

- Women Techmakers travel grant for Tensorflow Dev Summit. (2018)
- [Google Anita Borg Memorial Scholarship](#). (2016)
- Rutgers ECE Best TA Award. (2016)
- Rutgers ECE PhD Research Excellence Award. (2016)
- Google travel grant to attend Grace Hopper Conference for Women In Computing. (2016)
- IAPR travel stipend to present paper in International Conference on Pattern Recognition (2016)

- TA/GA Professional Development Fund Award, Rutgers University. (Summer 2017, Summer 2016, Spring 2016)
- Coached and designed project for a middle school student, who received an honorable mention for a national level competition by [ProjectCSGIRLS](#). (2015)
- [Charles Pankow National Award for Innovation](#), awarded by the American Society of Civil Engineers (ASCE) to Robotic Assessment Bridge Inspection Tool. Contribution: analysis of GPR scans. (2014)

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## Extracurricular Activities

- Co-founder and President, Novice-to-Expert coding club at Rutgers University. (2015 - 2017)
- Internal Vice President, Society of Women Engineers Graduate Chapter at Rutgers University. (2015 - 2017)
- Mentor for the 1000 Girls, 1000 Futures program from New York Academy of Sciences, The Academy at Rutgers for Girls in Engineering & Technology and ProjectCSGIRLS.