

# Spandan Madan

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CONTACT INFORMATION	spandan_madan@g.harvard.edu smadan@mit.edu (617)-682-2589 <a href="http://people.csail.mit.edu/smadan/web/">http://people.csail.mit.edu/smadan/web/</a>	Computer Science and Artificial Intelligence Laboratory Massachusetts Institute of Technology 32 D-410, 32 Vassar Street Cambridge, MA - 02139, USA
RESEARCH INTERESTS	Computer vision and computer graphics	
CURRENT APPOINTMENTS	<b>Harvard SEAS Fellow</b> Advisor : Hanspeter Pfister, Harvard University.	June 2017 - Present
	<b>Research Assistant, MIT</b> Advisors : Aude Oliva and Fredo Durand, MIT.	Dec 2016 - Present
EDUCATION	<b>Master of Engineering, Harvard University, USA</b> Computational Science and Engineering GPA : 3.835/4	Aug 2016 - present
	<b>Master and Bachelor of Technology, IIT Delhi, INDIA</b> Biochemical Engineering and Biotechnology Master's GPA : 9.0/10, Bachelor's GPA: 8.265/10	Aug 2010 - Dec 2015
RESEARCH EXPERIENCE	<b>COMPUTER VISION EXPERIENCE</b>	
	<b><i>Computer vision for automated understanding of infographics</i></b> MASTER'S THESIS (co-advised by Fredo Durand, Aude Oliva, Hanspeter Pfister)	Dec 2016 - Present
	<ul style="list-style-type: none"><li>• Worked on parsing and jointly reasoning over visual and textual elements in infographics, leading to three research papers this year.</li><li>• Extracted text from infographics using scene text recognition pipelines, and did topic modeling on the extracted text for category and tag prediction.</li><li>• Constructed a synthetic dataset, and trained supervised models to detect and classify icons in infographics.</li><li>• Currently working on unsupervised joint embedding models for text and icons extracted from within infographics.</li></ul>	
	<b><i>Anomaly detection in videos for ATM security cameras</i></b>	Jan 2016 - Apr 2016
	<ul style="list-style-type: none"><li>• Research Engineer at Uncanny Vision for a project with Qualcomm.</li><li>• Designed a fully convolutional autoencoder model based on the SegNet architecture for detecting suspicious human behavior in ATM security cameras in real time.</li></ul>	
	<b>PAST RESEARCH</b>	
	<b><i>Ensembled neural networks for predicting DNA-protein interactions</i></b>	Jan 2015 - Dec 2015
	<ul style="list-style-type: none"><li>• Worked on a project to predict DNA-protein binding sites for targeted gene editing, which led to two publications.</li></ul>	
	<b><i>Metrics for unsupervised clustering algorithms</i></b>	July 2014 - Dec 2015
	MASTER'S THESIS (Co-advised by University of Pennsylvania and IIT Delhi)	
	<ul style="list-style-type: none"><li>• Full time research engineer at University of Pennsylvania for six months, and continued project as thesis on returning to IIT.</li><li>• Designed metrics for comparing unsupervised protein clustering algorithms in the absence of gold standard data.</li></ul>	

PUBLICATIONS AND  
ABSTRACTS

**COMPUTER VISION**

1. **Madan, S.\***, Bylinskii, Z.\*, Tancik, M.\*, Recasens, A., Zhong, K., Alsheikh, S., Pfister, H., Durand, F. (2017) "Iconness: an Icon Proposal Mechanism for Annotating and Summarizing Infographics". [in submission] (\* implies equal contribution)
2. Bylinskii, Z.\*, Alsheikh, S.\*, **Madan, S.\***, Recasens, A.\*, Zhong, K., Pfister, H., Durand, F., Oliva, A. (2017) "Understanding Infographics Through Textual and Visual Tag Prediction". arXiv preprint arXiv:1709.09215. (\* implies equal contribution)
3. Bylinskii, Z., Kim, N.W., O'Donovan, P., Alsheikh, S., **Madan, S.**, Pfister, H., Durand, F., Russell, B., Hertzmann, A. (2017) "Learning Visual Importance for Graphic Designs and Data Visualizations", ACM User Interface Software and Technology Symposium (UIST)
4. Newman, A.P., Bylinskii, Z., Haroz, S., **Madan, S.**, Durand, F., Oliva, A. (2017) "Effects of title wording on memory of trends in line graphs" [abstract, in submission]

**PAST RESEARCH**

4. Dutta, S., **Madan, S.**, Parikh, H., Sundar, D., 2016. "An ensemble micro neural network approach for elucidating interactions between zinc finger proteins and their target DNA". BMC genomics, 17(13), p.1033.
5. Dutta, S., **Madan, S.**, Sundar, D., 2016. "Exploiting the recognition code for elucidating the mechanism of zinc finger protein-DNA interactions". BMC genomics, 17(13), p.1037.

INVITED LECTURES  
AND TALKS

- Berkeley Artificial Intelligence Research lab (BAIR)** Nov 2017  
Computer vision seminar series
- MIT Graphics Group** Nov 2017  
Computer graphics seminar series
- Harvard Business School** Oct 2017  
Some solved and unsolved problems in machine learning (<https://goo.gl/C8ZoDV>)
- HackMIT** Sept 2017  
The ubiquity of machine learning - capabilities and limitations of the existing paradigm.

REVIEWING  
EXPERIENCE

Helped review a paper in TPAMI (2017).

TEACHING AND  
MENTORSHIP

**Advanced Topics in Data Science (Graduate Class)** Harvard University  
*Teaching Fellow* Jan 2017 - May 2017  
Single handedly designed the final project for the class. Taught sessions on Deep Learning.

**Bioinformatics** IIT Delhi  
*Teaching Assistant* January 2015 - June 2015  
Taught lab sessions, taught extra lecture sessions to teach relevant computer science concepts to students in bioengineering, designed and graded assignments.

**Undergraduate student researchers mentored:**

1. Anelise Newman, MIT (September 2017 - Present)
2. Anirudh Suresh, Harvard University (September 2017 - Present)
3. Harsh Parikh, IIT Delhi (January 2015 - July 2015)

OTHER TECHNICAL  
PROJECTS

1. **HINGLISH**: Android app with over 50,000 downloads on google play store
2. **Online Tutorials**
  - An end to end implementation of a machine learning pipeline. (2750 stars on Github)
  - PyTorch tutorials