



The Robotics Institute
Carnegie Mellon University
Pittsburgh, PA 15213

January 8, 2012

Re: Dr. Lavanya Sharan

To Whom It May Concern:

Why do humans in computer-generated movies look so creepy and move so unnaturally? Why does text search on the Web works so amazingly well, while image search never seems to find what we want? How did Renaissance artists manage to create such vivid and life-like paintings while breaking every law of physics, whereas computer graphics images, despite being physically accurate, look so fake and lifeless?

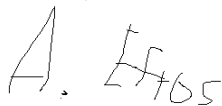
Answering questions such as these is absolutely critical for continued progress in practical domains such as computer graphics, computer vision, image retrieval, etc. This is because many (if not most) of the unsolved problems in visual computing are perceptual in nature – we want the computer to do not what's right, but what we humans want! Yet, understanding these phenomena turns out to be excruciatingly difficult because it requires addressing fundamental theoretical issues at the intersection of multiple disciplines – visual perception, neuroscience, optics, physics, computer science. There are perhaps only a dozen researchers in the world today who have the required skill-set, perseverance and foresight to be seriously working on these problems. **Lavanya Sharan** is one of them. Hiring her would be like purchasing a shovel-shop right before the gold rush – a truly great investment!

I am delighted to write this letter in support of Lavanya's application for a faculty position at your institution. I have known Lavanya for over five years, and have been following her work closely. I first met her while visiting Ted Adelson's lab at MIT – arguably the best place in the world to do this kind of research. Because of my previous work on visual texture, I took a keen interest in Lavanya's topic -- visual material perception. Her contribution in this area is, without a doubt, fundamental. Before, object material was largely synonymous with object texture (e.g. a brick wall). Lavanya convincingly argued that the perceived material properties, while certainly correlated with the texture as well as the shape of the object, can be successfully modeled on their own (e.g. brick wall can be "wet", "icy", "dirty", etc). Not only does Lavanya's thesis show strong psychophysical evidence for this view, but, most interestingly for me, her approach turns out to be quite useful for a practical computer vision task of material recognition (see her CVPR'10 paper)! Establishing this sort of connection between theoretical visual perception work and practical computer vision and graphics applications is crucially important, and this is where Lavanya really stands out. The combination of working at the top visual psychophysics lab in the world, while getting a PhD at the top computer science program in the world has given Lavanya the unique set of skills to finally bridge the historic disconnect between the two fields.

Needless to say, I was very happy when Lavanya accepted a post-doc position at Disney Research Pittsburgh, across the street from CMU. Besides being able to collaborate on research projects (e.g. we are currently working on a perception of outdoor illumination study), I finally found an accomplice for my long-cherished secret plan -- to teach a visual perception course tailored specifically to computer vision and graphics students. While I have always been extremely interested in visual perception, I felt that I didn't have the appropriate background to teach a course on it. Luckily, Lavanya eagerly agreed to co-teach with me. It turned out that no one has really offered such a course before, so we had to design it largely from scratch, calling it: **Pixels to Percepts: Visual Perception for Computer Vision & Graphics** (all course materials are online at: <http://graphics.cs.cmu.edu/courses/P2P/>). The original plan was to split the teaching load 50/50. Unfortunately, two weeks into the semester, I fell seriously ill. We even briefly considered canceling the course, but decided against it. But, in the end, it took me almost the entire semester to recover, and Lavanya had to take on the lion's share of the course. And she did a fantastic job! Her lectures well clear, fun, enlightening. She handled the assignment, the student presentation, and the final research projects like a complete pro, all while still working full-time at Disney Research! In other words, Lavanya found herself a very difficult situation, yet came out with flying colors. Not only did she demonstrate herself as a top-notch instructor, but also as a can-do problem solver -- two of the traits of a star faculty.

To summarize: in Dr. Lavanya Sharan, you have a chance to hire a Scientist with a capital S, a hard worker who is willing to attack the difficult problems and has the perseverance to carry through. By virtue of being both, a cognitive scientist and a computer scientist, she is uniquely positioned to solve some of the hardest questions in both visual perception and visual computing. I am pleased to recommend her.

Sincerely,

A handwritten signature in black ink, appearing to read 'A. Efros'.

Alexei (Alyosha) Efros
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Short Bio: Alexei (Alyosha) Efros is a Finmeccanica associate professor at the Robotics Institute and the Computer Science Department at Carnegie Mellon University. His research is in the area of computer vision and computer graphics, especially at the intersection of the two. Alyosha received his PhD in 2003 from UC Berkeley and spent the following year as a post-doctoral fellow in Oxford, England. Alyosha is a recipient of CVPR Best Paper Award (2006), the NSF CAREER award (2006), the Sloan Fellowship (2008), the Guggenheim Fellowship (2008), the Okawa Grant (2008), the ECCV Best Paper Honorable Mention (2010), and SIGGRAPH Young Research Award (2010). Two of his four graduated PhD students have tenure-track positions: Derek Hoiem (assistant professor at UIUC), and James Hays (assistant professor at Brown).