

Ankit K. Jain

3D Imaging & Vision Engineer

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Ph.D. research engineer with 5+ years experience. Expertise in computer vision and signal and image processing, specializing in depth sensing. Fast learner, strong analytical and communication skills.

Technical Skills

Algorithms Multi-view stereo, SLAM/visual odometry, 3D reconstruction, feature detection and tracking, virtual view synthesis, super-resolution

Cameras Calibration and compensation for lens shading, geometric distortion, intrinsics/extrinsics, and multi-camera alignment; autoexposure and autofocus algorithms

Software MATLAB (expert), C++ (proficient), Python (working), and related tools such as OpenCV and Qt, version control using Git

Education

University of California, San Diego **La Jolla, CA**
Ph.D., M.S., Electrical Engineering 2008–2014
Interdisciplinary doctoral research in stereo video compression, restoration, and filtering using principles from signal processing, computer vision, and vision science. Led a joint effort between the Engineering and Psychology departments supported by an NSF grant.

Stanford University **Stanford, CA**
B.S., Electrical Engineering 2001–2005
Focus in Signal Processing; Minor in Mathematics.

Professional Experience

Xperi Corporation **San Jose, CA**
Senior R&D Engineer 2016–present
Joined via acquisition of Pelican Imaging to develop new mobile 3D camera product line that will enhance photographic experiences, audiovisual immersion, and biometrics.

- Designing architecture and algorithms for 3D sensing from asymmetric stereo cameras.
- Starting up Xperi's computational imaging group and labs in Silicon Valley.

Pelican Imaging Corporation **Santa Clara, CA**
Technical Staff 2011–2016
Computational imaging research and development at a startup building array camera-based depth sensing solutions for mobile, AR/VR, and automotive technology.

- Key member of 9-person company. Early hire as a graduate intern, stayed on part-time through the remainder of grad school, and hired full-time upon graduation.
- Developed algorithms for several core features implemented in MATLAB/C++, resulting in multiple patents:
 - In charge of view synthesis feature to generate stereoscopic/free-viewpoint imagery.
 - Led development of pose estimation pipeline for 3D object scanning
 - Co-led project to augment a standard smartphone camera with 3D capabilities using a neighboring depth camera, and designed a fast autofocus mechanism.
 - Designed dense depth algorithm for real-time computation on a mobile processor.
- Designed new camera architectures in consideration of competing factors: depth accuracy, computational complexity, cost, form factor, and robustness.

MIT Lincoln Laboratory

Assistant Technical Staff

Lexington, MA

2005–2008

Signal processing algorithm and software development for radar/missile defense systems.

- Analyzed and developed background subtraction techniques in infrared video for missile guidance, tracking, and vision.
- Designed and programmed real-time system for analyzing radar signals in MATLAB.
- Wrote interface code in C++ for efficient data transfer between memory hardware and MATLAB in a high-speed, custom recording system.

Published Works

Selected Patents

K. Venkataraman, P. Gallagher, A. K. Jain, et al. **Autofocus System for a Conventional Camera that uses Depth Information from an Array Camera**, December 3 2015. WO Patent App. PCT/US2015/032,467.

K. Venkataraman, P. Gallagher, A. K. Jain, et al. **Array Cameras Including an Array Camera Module Augmented with a Separate Camera**, June 11 2015. 20150161798.

K. Venkataraman, P. Gallagher, A. K. Jain, and S. Nisenzon. **Systems and Methods for Stereo Imaging with Camera Arrays**, September 18 2014. US Patent App. 14/216,968.

D. Lelescu and A. K. Jain. **Feature Based High Resolution Motion Estimation from Low Resolution Images Captured Using an Array Source**, May 8 2014. WO Patent App. PCT/US2013/056,502.

Dissertation

A. K. Jain. *Perceived Blur in Stereoscopic Video: Experiments and Applications*. PhD thesis, University of California, San Diego, 2014.

Selected Publications

A. K. Jain and T. Q. Nguyen. **Discriminability Limits in Spatio-Temporal Stereo Block Matching**. *IEEE Trans. Image Process.*, 23(5):2328–2342, May 2014.

A. K. Jain, A. E. Robinson, and T. Q. Nguyen. **Comparing Perceived Quality and Fatigue for Two Methods of Mixed Resolution Stereoscopic Coding**. *IEEE Trans. Circuits Syst. Video Technol.*, 24(3):418–429, March 2014.

A. E. Robinson, A. K. Jain, M. Scott, D. I. A. MacLeod, and T. Q. Nguyen. **Apparent Sharpness of 3D Video When One Eye's View is More Blurry**. *i-Perception*, 4(6):456–467, 2013.

A. K. Jain and T. Q. Nguyen. **Video Super-Resolution for Mixed Resolution Stereo**. In *IEEE Int'l. Conf. Image Proc. (ICIP)*, pages 962–966, September 2013.

Honors & Activities

Member, IEEE Signal Processing Society, *2006–present*

Reviewer, Various IEEE and other international conferences and journals, *2011–present*

Elected member, UCSD Gordon Engineering Leadership Program, *2009–2014*

Mentor, UCSD Jacobs Undergraduate Mentoring Program, *2012–2013*