

Stanford



Vyas Akondi

Senior Research Scientist - Basic Life, Ophthalmology

Bio

BIO

My interest in optics research started during my undergraduate studies. I worked on better methods to detect the optical degradation in the images of ground-based astronomical telescopes due to atmospheric turbulence as part of my Ph.D. studies at the Indian Institute of Science. During my first postdoctoral position in University College Dublin, I developed digital methods using spatial light modulators for measuring the wave distortions in optical microscopy and vision science. Pyramid, point diffraction, Hartmann-Shack, and confocal signal-based wavefront sensors were explored. At the Institute of Optics in Madrid, as part of my second postdoctoral position, I worked on accurate optical quality evaluation techniques for patients implanted with multifocal intraocular lenses, and contributed to the development of mathematical methods and experimental validations to facilitate the demonstration of multifocal vision for prospective refractive surgery patients and contact lens wearers using a simultaneous vision simulator based on the tunable lens that works on the principle of temporal multiplexing.

CURRENT ROLE AT STANFORD

We develop next-generation ocular imaging devices to allow non-invasive visualization of subcellular structures in the eye with the goal of building clinically useful tools that help in early disease diagnosis and monitoring.

HONORS AND AWARDS

- Outstanding Reviewer Recognition, Optical Society of America (2016)
- Robert S. Hilbert Memorial Student Travel Grant, Optical Society of America and Optical Research Associates (2011)

EDUCATION AND CERTIFICATIONS

- Ph.D., Indian Institute of Science (2012)
- Master of Science, Sri Sathya Sai Institute of Higher Learning (2006)
- Bachelor of Science, Sri Sathya Sai Institute of Higher Learning (2004)

LINKS

- Dubra lab: <http://med.stanford.edu/dubralab.html>

Professional

WORK EXPERIENCE

- Senior Post Doctoral Researcher - Instituto de Optica (IO-CSIC) (12/22/2014 - 2/13/2018)
- Post Doctoral Researcher - University College Dublin (3/14/2012 - 8/31/2014)

PROFESSIONAL AFFILIATIONS AND ACTIVITIES

- Chair, Vision Technical Group, Optical Society of America (2019 - present)
- Committee Member, Optical Society of America (Optical Metrology Technical Group) (2014 - 2018)

Publications

PUBLICATIONS

- **Accounting for focal shift in the Shack-Hartmann wavefront sensor** *Optics Letters*
Akondi, V., Dubra, A.
2019; 44 (17): 4151-4154
- **Tunable lenses: dynamic characterization and fine-tuned control for high-speed applications** *Optics Express*
Dorrnsoro, C., Barcala, X., Gamba, E., Akondi, V., Sawides, L., Marrakchi, Y., Rodríguez-Lopez, V., Benedi-García, C., Vinas, M., Lage, E., Marcos, S.
2019; 27 (3): 2085-2100
- **Visual simulators replicate vision with multifocal lenses.** *Scientific reports*
Vinas, M., Benedi-García, C., Aissati, S., Pascual, D., Akondi, V., Dorrnsoro, C., Marcos, S.
2019; 9 (1): 1539
- **Centroid error due to non-uniform lenslet illumination in the Shack-Hartmann wavefront sensor** *Optics Letters*
Akondi, V., Steven, S., Dubra, A.
2019; 44 (17): 4167-4170
- **Experimental validations of a tunable-lens-based visual demonstrator of multifocal corrections.** *Biomedical optics express*
Akondi, V., Sawides, L., Marrakchi, Y., Gamba, E., Marcos, S., Dorrnsoro, C.
2018; 9 (12): 6302-17
- **Temporal multiplexing to simulate multifocal intraocular lenses: theoretical considerations** *Biomedical Optics Express*
Akondi, V., Dorrnsoro, C., Gamba, E., Marcos, S.
2017; 8 (7): 3410-3425
- **In Vivo Measurement of Longitudinal Chromatic Aberration in Patients Implanted With Trifocal Diffractive Intraocular Lenses** *Journal of Refractive Surgery*
Vinas, M., Gonzalez-Ramos, A., Dorrnsoro, C., Akondi, V., Garzon, N., Poyales, F., Marcos, S.
2017; 33 (11): 736-742
- **Evaluation of the true wavefront aberrations in eyes implanted with a rotationally asymmetric multifocal intraocular lens** *Journal of Refractive Surgery*
Akondi, V., Pérez-Merino, P., Martínez-Enriquez, E., Dorrnsoro, C., Alejandre, N., Jiménez-Alfaro, I., Marcos, S.
2017; 33 (4): 257-265
- **Virtual pyramid wavefront sensor for phase unwrapping** *Applied optics*
Akondi, V., Vohnsen, B., Marcos, S.
2016; 55 (29): 8363-8367
- **Phase unwrapping with a virtual Hartmann-Shack wavefront sensor** *Optics Express*
Akondi, V., Falldorf, C., Marcos, S., Vohnsen, B.
2015; 23 (20): 25425-25439
- **Optimization of sensing parameters for a confocal signal-based wavefront corrector in microscopy** *Journal of Modern Optics*
Jewel, A. R., Akondi, V., Vohnsen, B.
2015; 62 (10): 786-792
- **Closed-loop adaptive optics using a spatial light modulator for sensing and compensating of optical aberrations in ophthalmic applications** *Journal of Biomedical Optics*
Akondi, V., Jewel, A. R., Vohnsen, B.
2014; 19 (9): 096014-096014

- **Multi-faceted digital pyramid wavefront sensor** *Optics Communications*
Akondi, V., Castillo, S., Vohnsen, B.
2014; 323: 77-86
- **Digital phase-shifting point diffraction interferometer** *Optics Letters*
Akondi, V., Jewel, A. R., Vohnsen, B.
2014; 39 (6): 1641-1644
- **Myopic aberrations: Simulation based comparison of curvature and Hartmann Shack wavefront sensors** *Optics Communications*
Basavaraju, R. M., Akondi, V., Weddell, S. J., Budihal, R. P.
2014; 312: 23-30
- **A direct comparison between a MEMS deformable mirror and a liquid crystal spatial light modulator in signal-based wavefront sensing** *Journal of the European Optical Society-Rapid publications*
Jewel, A. R., Akondi, V., Vohnsen, B.
2013; 8: 13073-1 - 13073-10
- **A review of atmospheric wind speed measurement techniques with Shack Hartmann wavefront imaging sensor in adaptive optics** *Journal of the Indian Institute of Science*
Mysore Basavaraju, R., Akondi, V., Budihal, R.
2013; 93 (1): 67-84
- **Digital pyramid wavefront sensor with tunable modulation** *Optics Express*
Akondi, V., Castillo, S., Vohnsen, B.
2013; 21 (15): 18261-18272
- **Myopic aberrations: impact of centroiding noise in Hartmann Shack wavefront sensing** *Ophthalmic and Physiological Optics*
Akondi, V., Vohnsen, B.
2013; 33 (4): 434-443
- **X-ray attenuation coefficient of mixtures: Inputs for dual-energy CT** *Medical Physics*
Haghighi, R. R., Chatterjee, S., Akondi, V., Kumar, P., Thulker, S.
2011; 38 (10): 5270-5279