

PUBLICATIONS

Book Chapters

5. Goyal M., Rajpura P., Bojinov H., Hegde R. “Dataset Augmentation with Synthetic Images Improves Semantic Segmentation.” In: Rameshan R., Arora C., Dutta Roy S. (eds) *Computer Vision, Pattern Recognition, Image Processing, and Graphics. NCVPRIPG 2017. Communications in Computer and Information Science*, vol 841. Springer, Singapore, 2018.
4. Param Rajpura, Alakh Aggarwal, Manik Goyal, Sanchit Gupta, Jonti Talukdar, Hristo Bojinov, Ravi Hegde, “Transfer Learning by Finetuning Pretrained CNNs Entirely with Synthetic Images.” In: Rameshan R., Arora C., Dutta Roy S. (eds) *Computer Vision, Pattern Recognition, Image Processing, and Graphics. NCVPRIPG 2017. Communications in Computer and Information Science*, vol 841., pp 348–359, Springer, Singapore, 2018.
3. Ravi Hegde, S. Khatua, “Hot-carrier Generation in Plasmonic Nanostructures: Physics and Device Applications” to appear in “Nanoelectronics: Devices, Circuits and Systems, Editor: Brajesh Kumar Kaushik, *Advanced Nanomaterials book series*, Elsevier Publishers., 2018.
2. Ravi Hegde, “Nanophotonics for Structural Coloration”, in *Nanophotonics and Plasmonics: An Integrated View*, Editors: Ching Eng Png, Yuriy Akimov, *Series in Optics and Optoelectronics*, Taylor and Francis CRC Press, ISBN 9781498758673 — CAT# K27654, 2017.
1. Ravi Hegde, “Fractal Plasmonic Nanoantenna”, in *Reviews on Plasmonics 2016–2017*, Editor: Geddes, Chris D., Springer International Publishing, ISBN 978–3–319–48080–0, pp 55–76, 2017.

Preprints/Under Review

2. H. S. Vyas, R. S. Hegde; “The Fano Signature in the Optical Response of a Waveguide-excited Compound Plasmonic Nanoantenna”, arXiv:1710.05624, (Under review, *Journal of Nanophotonics*).
1. R. S. Hegde; “Accelerating Optics Design Optimizations with Deep Learning”, Under review, *SPIE Optical Engineering*, 2019.

Journals

25. Ramkumar B, Rob Laber, Hristo Bojinov, Ravi S. Hegde; “GPGPU Acceleration of the KAZE Image Feature Extraction Algorithm”, *Journal of Real-time Image Processing*, <https://doi.org/10.1007/s11554-019-00861-2>, 2019.
24. K. D. Donda and R. S. Hegde; “Optimal Design of Beam-Deflectors Using Extended Unit-Cell Metagratings”, *Progress In Electromagnetics Research M*, 77:83–92, 2019.
23. M. Mesch, T. Weiss, M. Schäferling, M. Hentschel, R. Hedge, and H. Giessen; “Highly sensitive refractive index sensors with plasmonics nanoantennas — utilization of optical spectral detuning of Fano resonances”, *ACS sensors*, 3(5):960–966, 2018.
22. K. D. Donda and R. S. Hegde; “Rapid design of wide-area heterogeneous electromagnetic metasurfaces beyond the unit-cell approximation”, *Progress In Electromagnetics Research M*, 60:1–10, 2017.
21. Krupali D. Donda, Ravi Sadananda Hegde; “Bilayered nanoantenna design improves the performance of silicon metasurfaces in the visible-wavelength region”, *SPIE Journal of Nanophotonics*, 11(4), 046002, 2017.
20. Anurag Soni, Surabhi Purohit, Ravi S Hegde; “Multilayered Aluminum Plasmonic Metasurfaces for Ultraviolet Bandpass Filtering”, *IEEE Photonics Technology Letters*, 29(1):110–113, 2017.
19. Vishal Vashistha, Gayatri Vaidya, Ravi S Hegde, Andriy E Serebryannikov, Nicolas Bonod, Maciej Krawczyk; “All dielectric metasurfaces based cross shaped resonators for color pixels with extended gamut”, *ACS Photonics*, 4(5), pp 1076–1082, 2017.
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15. Ravi Hegde, Hong-Son Chu, Kian Soo Ong, Lakshmi Kanta Bera, and Jason Png; “Periodic Microstructures for Improved Lens-to-Waveguide Coupling Efficiency in Microlens Array Planar Solar Concentrators”, *SPIE Journal of Photonics for Energy*, 5 (1), pp 052099, 2015.
14. Hegde, R. S., Hor, Y. L., Hofer, W. J. R.; “A Spatial Filter Bank Model of the Veselago-Pendry Superlens”, *Applied Physics A*, 120 (1), pp 25 –33, 2015.
13. Yejing Liu, Srikanth Pedireddy, Yih Hong Lee, Ravi S. Hegde, Weng Weei Tjiu, Yan Cui, Xing Yi Ling; “Precision Synthesis: Designing Hot Spots over Hot Spots via Selective Gold Deposition on Silver Octahedra Edges”, *Small*, 10(23), pp 4940 – 4950, 2014.
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Conferences

34. Ravi Hegde. “Deep Neural Network surrogate models for the accelerated design of optical devices and systems,” *SPIE Optics + Photonics 2019, Optical Engineering + Applications OP190*, San Diego, USA, 2019. (Invited).
33. Ravi Hegde, “Deep-Learning based Surrogate Models for Inverse Design of advanced optical devices. ell Approximation,” *Symposium E: Applications of Soft and Nonlinear Materials in Electronics and Optics, ICMAT 2019, The 10th International Conference on Materials for Advanced Technologies*, June 2019 (invited).
32. Ravi Hegde, Krupali Donda, S. S. Panda, “Optimal Design of Optical Metasurfaces Beyond the Unit-Cell Approximation,” *Symposium E: Applications of Soft and Nonlinear Materials in Electronics*

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31. Ravi Hegde, "Flat Optics - Computational Techniques for designing Wide-area Metasurfaces," International Symposium on Optics, OSI-ISO 2018, The XLII annual meeting of the Optical Society of India, IIT Kanpur, 20-22 September 2018. (invited)
30. G. Chalia, R. S. Hegde, "Study of Self-Heating Effects in Silicon Nano-Sheet Transistors", IEEE International Conferences on Electron Devices and Solid-State Circuits 2018, Shenzhen, China, June 2018.
29. J. Talukdar, S. Gupta, P. S. Rajpura, R. S. Hegde, "Transfer Learning via synthetic images for Object Detection using State-of-the-Art Deep Neural Networks", SPIN 2018, The 5th International Conference on Signal Processing and Integrated Networks, Noida, India, February 2018.
28. K. D. Donda, R. S. Hegde; "Evolutionary Algorithms for Designing Metalenses", The 3rd International Conference on Microwave and Photonics, BodhGaya, India, March 2018.
27. H. S. Vyas, R. S. Hegde; "Optical Response of Dielectric Waveguides loaded with Compound Plasmonic Resonators", The 3rd International Conference on Microwave and Photonics, BodhGaya, India, March 2018.
26. PS Rajpura, RS Hegde, H Bojinov; "Object Detection Using Deep CNNs Trained on Synthetic Images", NCVPIPRG 2017, The Sixth National Conference on Computer Vision, Pattern Recognition, Image Processing and Graphics, IIT Mandi, India, December 2017.
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24. Sarang Anant Kulkarni, Ravi S. Hegde; "Refractive-index Sensing using Hybrid All-dielectric Nanoantennae", ICANN-2017, The 5th International Conference on Advanced Nanomaterial and Nanotechnology, IIT Guwahati, India, Dec 2017.
23. R. S. Hegde; "Design of Plasmonic and All-dielectric Spectral Filters", ICMAT 2017, The 9th International Conference on Materials for Advanced Technologies, Singapore, 18–23 June 2017. (Invited)
22. A. Soni and R. S. Hegde; "Aluminum Plasmonic Multilayer Metasurface Ultraviolet Bandpass Filters", The 13th International Conference on Fiber Optics and Photonics, IIT Kanpur, India, December 2016.
21. K. Donda and R. S. Hegde; "Improved Transmission Efficiency in Silicon based Visible-wavelength Metasurfaces using Stepped Nanocone Elements", The 13th International Conference on Fiber Optics and Photonics, IIT Kanpur, India, December 2016.
20. Vishal Vashistha, Krupali Donda, Kaustubh Panse, Gayatri Vaidya, Ravi Hegde; "Design and Fabrication of CMOS-Compatible Ultra-thin Optical Components using Silicon Nanoantenna", National Symposium on Nano Science and Technology, CeNSE, IISc Bangalore, India, 29–30 June 2016
19. Ravi Hegde; "Fractal Tree Plasmonic Nanoantenna Array for Multispectral Surface –Enhanced Spectroscopy", IEEE Workop on recent advances in Photonics, WRAP 2015, IISc Bangalore, Dec 2015.
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17. Daniel Fullager, Ravi Hegde, Michael A. Fiddy; "Simulation and Observation of Enhanced Emission from Patterned Hyperbolic Metamaterials", META '15, The 6th International Conference on Metamaterials, Photonic Crystals and Plasmonics, New York, USA, June 2015.
16. Daniel Fullager, Ravi Hegde, Michael A. Fiddy; "Evaluation of Improvement of Absorption in HMMs Due to Interface Roughness by FEM", ICMAT 2015, The 7th International Conference on Materials for Advanced Technologies, Singapore, June 2015.
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Patents

1. HEDGE Ravi, KHOO Eng Huat, "Side-Illumination Optical System Based Non-Contact Liquid Fill-Height Determination For Automated Beverage Dispensing", Singapore Patent Application No.: 10201505881S Priority Date: 28 July 2015