KUNDAN CHAUDHARY, PH.D.

Summary

Trained in physics (optics), mathematics, materials, and computational tools with strong communication skills. I specialize in the design, characterization, and fabrication of optical elements/materials/structures along with data analysis, visualization, and machine learning.

Employment

Apple Inc. Cupertino, CA
Display Technologist Mar. 2019 to Jan. 2020

- Designed optical structures relevant to display systems using FDTD and Python
- Analyzed large quantity parametric data from engineering development and mass production to extract meaningful information for improving future Apple products
- Redesigned Monte Carlo simulations w/ OLED data to improve display performance
- Assessed OLED metrics w/ engineers during development and production phases
- Presented key data-driven findings to business leaders to inform decisions

Harvard University Cambridge, MA
Research Fellow Oct. 2018 to Mar. 2019

- Reduced time complexity of predicting polariton resonances via deep neural networks

Cambridge, MA
Graduate Research Assistant Aug. 2012 to Sept. 2018

- Conceived, designed, and optimized optical structures such as waveguide, metasurface
- Used near-field scanning optical microscopy (NSOM) (sources: SuperK and QCLs) to study the guided modes (TE/TM) and resonances in 2D vdW materials/metasurfaces
- Characterized 2D materials/metasurfaces using AFM, Raman spectroscopy, ellipsometry
- Used optimization techniques to engineer near-fields on plasmonic substrates (e.g., Ag)
- Determined polariton resonances by analyzing large scale hyperspectral imaging data
- Collaborated on >10 projects with research teams at Harvard, Columbia, UIUC, and MIT
- Published >15 papers in top peer-reviewed journals including Nature Communications
- Presented results at major conferences including American Physical Society

Cambridge, MA
Teaching Fellow (Optics & Photonics) Aug. 2018 to Dec. 2018

- Guided and lectured graduate students on various topics in optics and photonics

Illinois Wesleyan University Urbana, IL
Research Assistant Aug. 2010 to Dec. 2010

- Designed/built optical setup (beam shaping by Hamamatsu SLM) to establish optical traps
- Analyzed dynamics of micro-beads using custom-built particle tracking tools
- Tools included: Matlab

Selected Publications

(1) Chaudhary, K.; Tamagnone, M.; Yin, X. et al. Polariton nanophotonics using phase change materials. Nature Communications (2019).

(2) Chaudhary, K.; Tamagnone, M.; Rezaee, M. et al. Engineering phonon polaritons in van der Waals heterostructures to enhance in-plane optical anisotropy. Science Advances (2019).

(3) Tamagnone, M.; Ambrosio, A.; Chaudhary, K. et al. Ultra-confined mid-infrared resonant phonon polaritons in van der Waals nanostructures. Science Advances (2018).

(4) Wintz, D.*; Chaudhary, K.*; Wang, K. et al. Guided modes of anisotropic van der Waals materials investigated by near-field scanning optical microscopy. ACS Photonics (2018).

Google Scholar

Contact

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Education

Metis (Data Science Bootcamp)
Jan. 2020 to Mar. 2020
Metis is an ACCET accredited competitive 12-week onsite data science bootcamp. Topics included Python, algorithms, and machine learning.

Harvard University
Ph.D. Applied Physics 2018
S.M. Applied Physics 2015
Thesis Advisor: Prof. Federico Capasso

Illinois Wesleyan University
B.S. Physics/Mathematics 2010
Summa Cum Laude (GPA: 3.94/4)

Skills

Language/Software
Python, Matlab
Lumerical, Zemax, COMSOL, LightTools

Machine Learning
Linear Regression & Regularization
Classification & Clustering Models
Convolutional/Recurrent Neural Networks

Optical System Design
OLED Stack
Metasurfaces, Photonic Crystals
Optical Setups

Fabrication
E-Beam Lithography
CVD/ALD
E-Beam/Thermal Evaporators

Optical Characterization
FTIR, UV-VIS Spectrometers, Ellipsometry
AFM, SEM, FIB
Near-Field Microscopy