Abdullah S. Abbas

Materials Engineer

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SKILLS

Syntheses & Fabrications: Schlenk-line Quantum Dots & Nanoparticles Syntheses ($CsPbBr_3$, CdSe/CdS, PbS, InP, ZnO, TiO_2), Spin-Coating, Electrodeposition, CVD, ALD, Sputtering, Thermal Evaporation, Photolithography

Characterizations: TEM, SEM, EDX, AFM, XRD, FTIR, Raman, Quantum Yield, Laser spectroscopy, Spectrophotometer, Spectrofluorometer, Ellipsometry, Profilometer, Oscilloscope, Optical Microscope

Simulation & Programming: Quantum Espresso (DFT engine), Scaps (solar simulator tool), PSpice, OrCAD Capture, COMSOL Multiphysics, Python

Electronics: EagleCAD and KiCAD, Arduino, Raspberry Pi, Amplifiers (OpAmp/transistors)

Rapid Prototyping: CNC Machining, Soldering Through-hole and SMD, AutoCAD, Extrusion-based 3D Printing

WORK EXPERIENCE

Intel Corporation, Process Engineer / September 2024 – Present
- Thin Films

University of Chicago, Postdoctoral Scholar in Chemistry / July – September 2024
- Setup a novel spectroscopic tool, Photothermal Threshold Quantum Yield, to measure near unity photoluminescence quantum yield with relative error down to 0.2%. compared existing tools with >2%

University of California, Berkeley, PhD Candidate / January 2019 – May 2024
- Conducted air-free syntheses of Perovskite, Cadmium Chalcogenide, and Lead Chalcogenide Nanocrystals
- Executed optical and structural characterizations of synthesized materials

Quantum Solutions Inc, VP of Product / May – July 2018
- Managed product manufacturing, inventory, and packaging

Quantum Solutions Inc, Product Developer / December 2017 – May 2018
- Established large-scale production of PbS Quantum Dots using a microfluidic flow-based reactor
- Implemented Perovskite Quantum Dots for LCDs and UV detector applications

Pitch Competitions:

Pitched and won first place with an award of $26k in the 2018 MIT Enterprise Forum competition

Droplab Inc, Co-Founder / September 2016 – July 2017
- Developed a device for digitally manipulating fluid drops, involving high-voltage AC Signal Amplifiers and CNC machining
- Utilized material science principles to create hydrophobic and dielectric coatings controlled by voltage

University of California, Berkeley, Research Assistant at Prof. Alivisatos Group / January – August 2016
- Synthesized quantum dots and studied their photophysics dynamics using laser spectroscopy

University of Toronto, Research Assistant at Prof. Sargent Group / August 2014 – April 2015
- Designed a solar cell structure that achieved a record efficiency of 9.99% submitted in early 2016

KAUST, Research Assistant at Prof. Mohammed Group / January – April 2014
- Conducted research on optimal Donor-Acceptor organic molecules for LEDs
- Used Ultrafast Femtosecond Laser spectroscopy and spectrometers to study efficiency and stability

University of Waterloo, Research Assistant at Prof. Maheshwari Group / April – December 2013
- Built a single electron transistor using Gold Nanoparticles with Zinc Oxide nanowires as the gate electrode

EDUCATION

Doctor of Philosophy (PhD): Materials Science and Engineering,
University of California, Berkeley, Supervisor: Alivisatos / January 2019 – May 2024

Master of Science in Engineering: Materials Science and Engineering,
University of California, Berkeley, Supervisor: Alivisatos / January 2019 – May 2021

Bachelor of Applied Science: Honours Nanotechnology Engineering,
Co-operative Program, University of Waterloo / September 2012 – April 2017