Daniel Hashemi

Research Investigator, University of Michigan

Ann Arbor, MI
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• Ability to motivate teams, provide leadership with enthusiasm and drive
• Excellent written and verbal communication skills
• Strong analytical and problem solving skills
• Strong mathematical modeling and software development skills
Authorized to work in the US for any employer

WORK EXPERIENCE

Research Investigator

Department of Materials Science and Engineering, University of Michigan - Ann Arbor, MI - January 2015 to Present

Responsibilities
Use computer simulation methods to study the structure and properties of materials on the atomic scale. Work on a wide range of projects, most involving strong collaborations with experimental colleagues, and focusing on critical materials needs. Develop and apply accurate first-principles atomistic computational methods to enable deeper understanding of electronic and optical phenomena at the quantum level, in view of designing next-generation materials and devices.

Accomplishments
• Predictive design of conjugated polymers, the electronic properties thereof, and the self-assembly behavior into thin-film organic semiconductor devices
• Design of novel organic and hybrid molecules with improved photon absorption characteristics
• Modeling photovoltaic materials and solar cells to increase efficiency
• Optimization of process associated with the charge transport and polaron separation at interfaces in the photovoltaic process
• Defined the nanoreactor concept for nano-size structures using ab initio molecular dynamics
• Performed computer-aided design approach to extract molecular design criteria for light-emitting diodes (LEDs)

Research Assistant

Martin Luther University - Halle (Saale) - October 2007 to January 2015

Responsibilities
Investigated structural, electronic and magnetic properties of nanowires and single atoms on metallic surfaces to develop future high-density data-storage technologies based on magnetism, by moving from two- dimensional (regular hard drive) to one-dimensional (nanowire) and zero-dimensional (single atom) magnetism.

Accomplishments
• Provided development, innovation and implementation of computational tools to explore electronic and magnetic properties of nanostructures
• Explored and analyzed the thermodynamic properties and stability of magnetic materials

• Developed and deployed a novel computational tool to extract exchange coupling constants by making artificial magnetic configurations

EDUCATION

Ph.D. in Physics

The International Max Planck Research School in conjunction with Martin Luther University - Halle (Saale)
2007 to 2015

SKILLS

SYSTEMS: LINUX, WINDOWS, MAC LANGUAGES: FORTRAN 90, C/C++, PASCAL, PYTHON AB INITIO CODES: VASP, WIEN2K, ABINIT, GAUSSIAN 09, SIESTA MISCELLANEOUS: MAPLE, MATHEMATICA, SHELLSCRIPT, LATEX, GNUPLOT, XMGRACE, ORIGIN, POV-RAY, VRML, MS OFFICE