Samar Alqatari

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Education

Stanford University Stanford, CA — Sep 2014
B.S. in Mechanical Engineering, minor in History

Dhahran Ahliyya Schools Dhahran, Saudi Arabia · High School Diploma — Jun 2010

Work

Center for Complex Engineering Systems (CCES) · Riyadh, Saudi Arabia & Boston, MA — Nov 2014-present
Research Specialist · modeling, simulating, and developing integrated decision-making tools for complex Saudi systems. Part of SIPS and SSDN projects. Working on the impact of air-quality and dust on solar technologies, especially as pertaining to various Saudi infrastructure systems, and evaluating potential dust-mitigation

Center for Advanced Molecular Photovoltaics (CAMP) · Stanford University, CA — Jun-Aug 2013
Research Intern · worked on manufacturing, characterizing, modifying properties, and testing perovskite solar cells

Laboratory for Energy and Nano Sciences (LENS) · Masdar Institute, UAE — Jun-Aug 2012
Research Intern · worked on characterizing topographic and electric characteristics of a zinc oxide-coated silicon substrate

Honors

KACST Advanced Training Program (ATP)
Graduate scholarship program covering full tuition, research and living stipends for both masters and PhD degrees

KAUST Gifted Student Program
Saudi scholarship program (less than 1% acceptance) covering all undergraduate studies expenses

Research

Dust Impact on Solar Technologies and Mitigation Optimization · CCES, KACST & MIT — Nov 2014—present
Created a framework for quantifying impact of dust on solar technologies, and developed a spatiotemporal optimization model for solar PV taking into account dust, and evaluating potential for dust mitigation using self-cleaning technologies. Currently modeling dust accumulation on solar panels theoretically and experimentally. Under supervision of Prof. Olivier de Weck

Strategic Solar Desalination Network (SSDN) · CCES, KACST & MIT — Nov 2014—present
Studying the concept of solar-powered desalination in Saudi Arabia. Running simulations for solar PV and CSP plant performance models and coupling with desalination and dust mitigation models. Under supervision of Prof. Olivier de Weck

Sustainable Infrastructure Planning System (SIPS) · CCES, KACST & MIT — Nov 2014—Aug 2015
Modeling Saudi energy, water, and air-quality systems. Running various scenarios and optimizing for sustainability under the inclusive wealth framework. Worked on the connection between air-quality and solar energy potential. Under supervision of Prof. Noelle Selin and Prof. Kenneth Strzepek

Surface Modification of TiO2 to Remove tBP from Perovskite Solar Cells · CAMP, Stanford University — Jun-Aug 2013
Investigated the cutting-edge perovskite solar technology. Built modified solar cells by replacing the thermally unstable chemical tBP with acid and base solutions, in order to stabilize the cells while maintaining high voltage and efficiency. Under supervision of Prof. Michael McGehee at the Center for Advanced Molecular Photovoltaics

ZnO Thin Film Characterization Using AFM · Masdar Institute, UAE — Jun-Aug 2012
Characterized Si wafers coated with ZnO thin films with different growth temperatures, using AFM. Tested topography and local electric properties, and explored applications in solar cells. Supervised by Prof. Matteo Chiesa and Prof. Ammar Nayfeh

Physical Experiential Technology Systems (PETS) · Stanford University Jan-Mar 2011

Used wireless sensing and monitoring devices to influence environmental behavioral change in households. Brainstormed, ideated, presented, then implemented. Winner of General Electric's People Power Challenge. Supervised by Prof. Banny Banerjee

Publications and Posters

[5] S. Alqatari, S. Casimiro, O. De Weck, and A. Alfaris, "Model for Assessment of the Dust Impact on CSP Plant Performance in Saudi Arabia," SolarPACES *(poster)*, 2015.

[4] S. Alqatari, A. Alhassan, O. de Weck, and A. Alfaris, "Spatiotemporal Model for Dust Impact and Mitigation for Solar PV using Saudi Arabia as a Case Study," 31st European Photovoltaic Solar Energy Conference and Exhibition *Conference Proceedings*, pp. 2166–2173, 2015.

[3] N. Hoffman, E. Couzo, S. Alqatari, and N. E. Selin, "A study of dust storm impact on solar panel efficiency in Saudi Arabia," 7th International GEOS-Chem Meeting *(poster)*, 2015.

[2] S. Alqatari, A. Alfaris, and O. L. De Weck, "Cost and Performance Comparative Model of Dust Mitigation Technologies for Solar PV in Saudi Arabia," International Scientific Journal of Environmental Science, vol. 4, 2015.

[1] N. El-Atab, S. Alqatari, F. B. Oruc, T. Souier, M. Chiesa, A. K. Okyay, and A. Nayfeh, "Diode behavior in ultra-thin low temperature ALD grown zinc-oxide on silicon," AIP Advances, vol. 3, no. 10, 2013.

Leadership

Alternative Spring Break · Stanford University & Bay Area Sep-Mar 2013

Taught a seminar class (to a group of twelve undergraduate students) then led a week-long service-learning trip in the Bay Area on theories and methods of resistance and change. Designed syllabus; led lecture and discussion; forged connections with local organizations; and managed housing, budget, and daily activities of trip

Engineers for a Sustainable World · Stanford University Jan-Jun 2012

Designed a food storage system,with cooling and humidity control for the Anam City project in Nigeria. Investigated, prototyped, modeled (using CAD and MATLAB) then presented to the sponsoring Chife Foundation. Supervised by Prof. Jenna Davis

Stanford University Undergraduate Senate · Stanford University Apr 2011-May 2012

Served as one of Stanford's 15 elected Undergraduate Senate members; was chair of Academic Affairs committee and deputy chair of Appropriations Committee; managed a $3 million annual budget for student groups, co-authored and passed bills, developed programs, organized events, and advocated for campus issues

Arab Student Association at Stanford · Stanford University Jan-May 2012

Co-Founder & Board Member; goal to promote social and cultural Arab community and events on campus; was liaison between group members and administration, wrote constitution, and organized meetings

TEDxYouth@Jeddah Featured Speaker · Jeddah, Saudi Arabia Dec 2011

Featured speaker in TEDx-Jeddah in front of 400 people. Spoke about design thinking, innovation, and design for development

Future Social Innovation Network · Stanford University Sep 2010-Mar 2011

Board member; promoting social entrepreneurship on campus; organizing Stanford's Social Innovation and the Social Entrepreneur speaker seminar series

Think Green · Saudi Arabia Mar 2008-Jul 2010

Founder and President; environmental sustainability youth volunteer group; organized campaigns and raised funds

Skills

Coursework math and science, solid & fluid mechanics, controls, systems design, manufacturing, materials, electronics

Language fluent in English and Arabic

Programming MATLAB, Python, SolidWorks, Java, Flash CS3, Illustrator, MS Office, iMovie

Materials science lab using atomic force microscopy, spin coater, solar simulator

Machining & Manufacturing mill and lathe, welding, brazing, sand casting, wood working

Interests research, network science, complex systems, energy, environment, sustainability, history, political economy, etc