Jacob Boes

Curriculum Vitae

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WORK EXPERIENCE

PhD Candidate in Chemical Engineering 2012-present

Carnegie Mellon University – Pittsburgh, PA

- Research on first principles catalysis and surface science of transition metal alloys with Prof. J. Kitchin
- Strong focus on effective teaching methods in the field of engineering
- Developing tools for more efficient means of sharing reproducible research

Paper Mill Technical Intern 2010-2011

Domtar Paper Corporation – Rothschild, WI

- Managed hourly workers for plant projects
- Performed product testing and ensured enforcement of product specifications
- Designed software for efficiency of data entry, storage, and retrieval

EDUCATION

BS Chemical Engineering 2007-2012

Michigan Technological University – Houghton, MI

Summa Cum Laude. Academic/Research advisors: D. Shonnard, T. Rogers, and J. King
Minor in Hydrogen Fuel Cell Technologies

PUBLICATIONS

5. Jacob R. Boes, Mitchell C. Groenenboom, John A. Keith and John R. Kitchin, "Neural network and ReaxFF comparison for Au properties", *Int. J. Quantum Chem.* **116(13)**, 979 (July 2016).

4. John Michael, Ethan L. Demeter, Steven M. Illes, Qingqi Fan, Jacob R. Boes, and John R. Kitchin, "Alkaline Electrolyte and Fe Impurity Effects on the Performance and Active-phase Structure of NiOOH Thin Films for OER Catalysis Applications", *J. Phys. Chem. C* **119(21)**, 11475 (May 2015).

3. Gamze Gumuslu, Petro Kondratyuk, Jacob R. Boes, Bryan David Morreale, James B. Miller, John R. Kitchin, and Andrew J. Gellman, "Correlation of Electronic Structure with Catalytic Activity: H_2-D_2 Exchange across Cu_xPd_{1-x} Composition Space", *ACS Catalysis* **5(5)**, 3137 (2015).

2. Jacob R. Boes, Peter Kondratyuk, Chunrong Yin, James B. Miller, Andrew J. Gellman, and John R. Kitchin, "Core level shifts in Cu-Pd alloys as a function of bulk composition and structure", *Surface Science* **640**, 127 (Oct 2015).

1. Jacob R. Boes, Gamze Gumuslu, James B. Miller, Andrew J. Gellman, and John R. Kitchin, "Estimating Bulk-Composition-Dependent H_2 Adsorption Energies on Cu_xPd_{1-x} Alloy (111) Surfaces", *ACS Catalysis* **5(2)**, 1020 (2015).

CONFERENCE PARTICIPATION

Neural Network Predictions of Oxygen Interactions on a Dynamic Pd Surface:

1. AIChE Annual Meeting, San Francisco, 11/16/16 (Poster)

Practical Data Sharing for Molecular Simulation:

3. AIChE Annual Meeting, San Francisco, 11/14/16 (Poster)
2. Midwest Theoretical Chemistry Conference, Pittsburgh, 6/9/16 (Poster)
1. International Open Access Week, Pittsburgh, 10/29/15 (Poster)

Neural Network and ReaxFF Comparison for Au Properties:

3. AIChE Annual Meeting, San Francisco, 11/15/16 (Talk)
2. CMU Simulators Meeting, Pittsburgh, 5/25/16 (Talk)
1. Annual ChEGSA Symposium, Pittsburgh, 10/23/15 (Talk)

Core level shifts in Cu-Pd alloys as a function of bulk composition and structure:

4. Annual Innovation with Impact Research Exhibition, Pittsburgh, 4/7/16 (Poster)
3. AIChE Annual Meeting, Salt Lake City, 11/10/15 (Talk)
2. 24th Meeting of the North American Catalysis Society, Pittsburgh, 6/14/15 (Talk)
1. CMU Simulators Meeting, Pittsburgh, 5/20/15 (Talk)

Estimating Bulk Composition Dependent H_2 Dissociative Adsorption Energies on Cu_xPd_{1-x} Alloy (111) Surfaces:

5. AIChE Annual Meeting, Atlanta, 11/18/14 (Talk)
4. Annual ChEGSA Symposium, Pittsburgh, 10/17/14 (Talk)
3. CMU Simulators Meeting, Pittsburgh, 6/10/14 (Talk)
2. Pittsburgh-Cleveland Catalysis Society Conference, Pittsburgh, 6/2/14 (Talk)
1. Annual ChEGSA Symposium, Pittsburgh, 10/11/13 (Poster)

Production of Purified Hydrogen as an Alternative Energy Source:

1. Andrew Carnegie Society, Pittsburgh, 4/12/14 (Poster)

AWARDS

- 2015 ACS Summer Institute Certificate of Innovation
- 2015 Mark Dennis Karl Outstanding Graduate Teaching Assistant Award
- 2015 Bertucci Graduate Fellowship
- 2014 Graduate Student Assembly Outstanding Representative Award
- 2007 Michigan Technological University Presidential Scholarship

TEACHING

@ Carnegie Mellon University, Chemical Engineering Dept.:

- Fall 13, 14, 16: **Chemical Reaction TA**
- Spring 16: **Mathematical Software TA**
- Spring 14, 15: **Molecular Simulation TA**
- Spring 13: **Intro to Chemical Engineering TA**
- Fall 12: **Undergraduate Thermodynamics TA**

@ Michigan Technological University, Chemistry Dept.:

- Fall 08, 09, 11 Spring 09, 10, 12: **Chemistry Learning Center Coach**
    - Tutored undergraduates in chemistry and good studying skills

SERVICE AND OUTREACH

- 2015-2016 Pittsburgh-Cleveland Catalysis Society – Secretary
- 2015 CMU Chemical Engineering Graduate Student Association – Symposium Chair
- 2014 CMU Graduate Student Assembly (GSA) – Service Committee Chair & Founder
- 2014 CMU Chemical Engineering Graduate Student Association – Vice President
- 2013 CMU Chemical Engineering Graduate Student Association – GSA Representative

PROGRAMMING

Python • LaTeX • Linux shell scripting • Matlab • MathCAD • Visual Basic • UniSim