

Curriculum Vitae

# Seongjoo Jung

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## Education

**University of Minnesota** Minneapolis, MN, USA  
*Ph.D. Candidate, Chemical Engineering* (GPA 4.00/4.00) 2020–present  
Department of Chemical Engineering and Material Science (CEMS)  
Advisors: Turan Birol, Paul J. Dauenhauer

**Seoul National University** Seoul, Korea  
*Bachelor of Science, Major in Chemical and Biological Engineering* 2015–2020  
*Minor in Computer Science and Engineering*  
Honors: summa cum laude  
Advisors: Yung-Eun Sung

## Research Experiences

**Graduate Researcher**, University of Minnesota 2020–present

- Discovered octahedral rotation-induced P-E hysteresis loops in perovskite materials.
- Developed polarized-ground state calculation for metal/insulator heterostructure for VASP (commercial ab initio quantum mechanical calculations software) using Fortran and Python.
- Analyzed Pt/PbTiO<sub>3</sub> systems at different support polarization geometrically and electronically using Bader, DDEC6 charges, (integrated) PDOS, real-space charge density, demonstrating interface effects on surface active sites.
- Predicted adsorption energy changes related to d-band structure changes, and discovered breaking of transition-state scaling relations using CI-NEB.

**Research Intern**, Seoul National University and Korea Center for Artificial Photosynthesis 2018–2019

- Synthesized CuInS<sub>2</sub>-based photocathode for photoelectrochemical CO<sub>2</sub> reduction, using electro/chemical depositions.
- Performed multilayer electrodes analysis with XRD, XPS, SEM, EDX, product analysis with GC and <sup>1</sup>H NMR.
- Analyzed electrochemical reactions with LSV, CV, CA, Tafel plot and EIS Nyquist plot.

## Awards and Honors

Kokes Award 2023

- North American Catalysis Society

The Lanny & Charlotte Schmidt and Duane Goetsch & Nancy M. Dickerson Fellowship 2021

- CEMS, University of Minnesota

Fridley Fellowship 2021

- CEMS, University of Minnesota

Peter and Gene Pierce Fellowship 2021

- CEMS, University of Minnesota

Samsung Convergence Software Course Scholarship	2017–2020
<ul style="list-style-type: none"> <li>• Samsung Electronics. Minor program with scholarship for selected non-computer science major students</li> </ul>	
National Scholarship for Science and Engineering (full tuition)	2015–2020
<ul style="list-style-type: none"> <li>• Ministry of Science and ICT, Korea. Provided full tuition coverage for 48 months</li> </ul>	

## External Research Resources

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ACCESS (formerly XSEDE) Startup Allocations	2022–2023
<ul style="list-style-type: none"> <li>• National Science Foundation</li> </ul>	
Discover ACCESS Allocations	2023–2024
<ul style="list-style-type: none"> <li>• National Science Foundation</li> </ul>	

## Teaching

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Teaching Assistant, University of Minnesota	
<ul style="list-style-type: none"> <li>• ChEn 3101: Chemical Engineering Thermodynamics <ul style="list-style-type: none"> <li>– Head TA and Recitation TA. Taught 10 sessions of Recitation to students, provided office hours and supplementary course materials.</li> </ul> </li> </ul>	Spring 2023
<ul style="list-style-type: none"> <li>• 4401W: Senior Chemical Engineering Lab (Unit Ops) <ul style="list-style-type: none"> <li>– Lab TA for distillation, gas membrane separation, non-Newtonian pipe flow, ion exchange, humidification &amp; water-cooling experiments. Grading TA for humidification &amp; water-cooling experiment.</li> </ul> </li> </ul>	Fall 2021

## Talks and Conferences

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North American Catalysis Society Meeting, Providence, RI	Jun 2023
“Support Polarization Control of Catalysts: Elucidating and Breaking Scaling Relations”	
Gordon Conference – Catalysis, New London, NH (Accepted)	Jun 2022
“Catalyst Charge Injection via Polarized Ferroelectric Support-Metal Interaction”	

## Programming Skills

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(From Most Used) Python; MATLAB; Java; Unix; LaTeX; HTML/CSS; JavaScript; Git; PyTorch; C; C++; FORTRAN;

## Publications

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**Jung S.**, Pizzolitto C., Biasi P., Dauenhauer P. J., Birol, T. “Programmable Catalysis by Support Polarization: Elucidating and Breaking Scaling Relations”, *Nature Communications* **14**, 7795 (2023)

**Jung S.**, Dauenhauer P. J., Birol, T. “Rotation-Induced, Antiferroelectric-like Double Hysteresis of Perovskites” (Manuscript available upon Request)