Minsik Cho 조민식

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Education

2022 – Current	**Ph.D.**, Chemistry, Massachusetts Institute of Technology
2016 – 2022	**Sc.B.**, Chemical Physics (with Honors, *magna cum laude*), Brown University

Research Experience

2022 – Current	Graduate Research Assistant, Massachusetts Institute of Technology (Advisor: Troy Van Voorhis)
2016 – 2022	Undergraduate Researcher, Brown University (Advisor: Brenda Rubenstein)
2021	SURF-CTC Summer Research Fellow, University of Chicago (Advisor: Laura Gagliardi)
2019	Kupcinet-Getz Summer Research Fellow, Weizmann Institute of Science (Advisor: Gershom Martin)

Awards & Honors

Aug 2023	MIT Department of Chemistry Award for Outstanding Teaching
Sep 2022	MIT Presidential Fellowship [Robert T. Haslam (1911) Fellow]
Jul 2022	Kwanjeong Fellowship
May 2022	ACS PHYS Undergraduate Award in Physical Chemistry
May 2022	Paul Cross Prize in Chemistry
May 2022	Commendation of Excellence in Research
Jun 2020	Karen T. Romer Undergraduate Teaching & Research Award
Mar 2019	Army Commendation Medal (ARCOM; DCG-S, Eighth US Army)

Publications

Google Scholar † Equal contribution

Journal Articles

J1. Weisburn, L. P.[†], **Cho, Minsik**[†], Bensberg, M., Meitei, O. R., Reiher, M. & Van Voorhis, T. Multiscale Embedding for Quantum Computing. *Journal of Chemical Theory and Computation* **21,** 4591–4603 (2025).

J2. Erakovic, M., Witteveen, F., Harley, D., Günther, J., Bensberg, M., Meitei, O. R., **Cho, Minsik**, Van Voorhis, T., Reiher, M. & Christandl, M. High ground state overlap via quantum embedding methods. *PRX Life* **3,** 013003 (2025).

J3. Tran, H. K., Weisburn, L. P., **Cho, Minsik**, Weatherly, S., Ye, H.-Z. & Van Voorhis, T. Bootstrap Embedding for Molecules in Extended Basis Sets. *Journal of Chemical Theory and Computation* **20,** 10912–10921 (2024).

J4. Berquist, E., Dumi, A., Upadhyay, S., Abarbanel, O. D., **Cho, Minsik**, Guar, S., Gil, V. H. C., Hutchison, G. R., Lee, O. S., Rosen, A. S., Schamnad, S., Schneider, F. S. S., Steinmann, C., Stolyarchuk, M., Vandezande, J. E., Zak, W. & Langner, K. M. cclib 2.0: An Updated Architecture for Interoperable Computational Chemistry. *The Journal of Chemical Physics* **161,** 042501 (2024).

J5. Mitra, A., Hermes, M. R., **Cho, Minsik**, Agarwal, V. & Gagliardi, L. Periodic Density Matrix Embedding for CO Adsorption on the MgO(001) Surface. *The Journal of Physical Chemistry Letters* **13,** 7483–7489 (2022).

J6. Santra, G., **Cho, Minsik** & Martin, J. M. L. Exploring Avenues beyond Revised DSD Functionals: I. Range Separation, with xDSD as a Special Case. *The Journal of Physical Chemistry A* **125,** 4614–4627 (2021).

J7. **Cho, Minsik**, Sylvetsky, N., Eshafi, S., Santra, G., Efremenko, I. & Martin, J. M. L. The Atomic Partial Charges Arboretum: Trying to See the Forest for the Trees. *ChemPhysChem* **21,** 688–696 (2020).

J8. Liu, Y., **Cho, Minsik** & Rubenstein, B. Ab Initio Finite Temperature Auxiliary Field Quantum Monte Carlo. *Journal of Chemical Theory and Computation* **14,** 4722–4732 (2018).

Working Papers

W1. **Cho, Minsik** & Van Voorhis, T. *Partially Updated Bootstrap Embedding* 2025.

W2. **Cho, Minsik**[†], Meitei, O. R.[†], Weisburn, L. P.[†], Weser, O.[†], Weatherly, S.[†], Van Voorhis, T., *et al. QuEmb: A Toolbox for Bootstrap Embedding Calculations of Molecular and Periodic Systems* 2025.

Presentations

Talks

T1. **Cho, Minsik**, Van Voorhis, T. & FreeQuantum Collaboration. *Quantum Chemistry with Limited Quantum Resources Using Bootstrap Embedding* (제한된 양자 컴퓨터 자원을 이용한 양자 화학 시뮬레이션: Bootstrap Embedding 기반 전략). Korea Research Institute of Standards and Science Seminar (*Invited*). 2025.

T2. **Cho, Minsik**, Weisburn, L. P. & Van Voorhis, T. *Efficient Quantum Chemistry on Classical and Quantum Computers using Bootstrap Embedding* NTT Basic Research Laboratories (*Invited*). 2025.

T3. **Cho, Minsik** & Van Voorhis, T. *Partially Updated Bootstrap Embedding.* American Chemistry Society (ACS) Fall 2024 (*Contributed*; Denver, CO). 2024.

T4. **Cho, Minsik**[†], Weisburn, Leah P.[†] & Van Voorhis, T. *Quantum Chemistry with Limited Quantum Resources Using Bootstrap Embedding* (제한된 양자 컴퓨터 자원을 이용한 양자 화학 계산: Bootstrap Embedding 기반 전략). Samsung Advanced Institute of Technology (SAIT) Simulation Society (*Invited*; Suwon, Korea). 2024.

Posters

P1. **Cho, Minsik** & Van Voorhis, T. *New Frontiers of Bootstrap Embedding for Realistic Chemical Applications* Telluride School on Theoretical Chemistry (TSTC) (Telluride, CO). 2025.

P2. **Cho, Minsik** & Van Voorhis, T. *New Frontiers of Bootstrap Embedding for Realistic Chemical Applications* 11th Triennial Conference on Molecular Quantum Mechanics (MQM) (Kyoto, Japan). 2025.

Teaching

Massachusetts Institute of Technology

Jan 2024 MIT Professional Development Certificate in Research Mentoring
Spring 2023 *Teaching Assistant*, Thermodynamics and Kinetics (5.601 & 5.602)
Fall 2022 *Head Teaching Assistant*, Thermodynamics and Kinetics (5.601 & 5.602)

Brown University

Spring 2021 *Teaching Assistant*, Inorganic Chemistry (CHEM500) Computational Lab
Fall 2020, Spring 2021, and Fall 2021
Teaching Assistant, Equilibrium, Rate, and Structure (CHEM330)

Software

QuEmb

One of the main developers for QuEmb, a Python package developed in the Van Voorhis Group for Bootstrap Embedding calculations.

cclib

Contributed to the development of cclib, a Python-based parsing and postprocessing library for computational chemistry workflows. Participated in the Google Summer of Code 2020.

Service

2024 – Current	*Organizer*, Greater Boston Area Theoretical Chemistry (Theochem) Seminar Series
2024 – Current	*Co-organizer*, Fika: Weekly Coffee Hour for MIT Theoretical Chemists
2023 – Current	*Mentor*, MIT Chemistry Peer Mentorship Program
2023 – 2024	*Facilitator*, MIT Teaching Assistants Training (Graduate Student Orientation)
2023	*Panelist*, MIT ACCESS Student Panel
2023	*Mentor*, MIT Chemistry Application Mentor Program (CAMP)
2022	*Panelist*, Brown University International Student Internships in Focus: STEM
2020 – 2021	*Board Member*, University Council of Students (UCS) IT Advisory Board
2020	*Judge*, Times Squared Academy (Providence, RI) Annual Science Fair

Other Experiences

2019 – 2022	High Performance Computing Consultant, Center for Computation and Visualization
2017 – 2019	Unit Information Technology Specialist & Platoon Senior KATUSA, Eighth US Army
2016 – 2017	Student Technician, Brown University Computing and Information Services

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