NUTTH TUCHINDA

Postdoctoral Associate (Schuh and Olson group)
MIT Department of Materials Science and Engineering
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Education

Massachusetts Institute of Technology 2019 - 2023
Ph.D. in Materials Science and Engineering with Teaching Minor
Thesis Title: Polycrystalline Grain Boundary Solute Segregation at Finite Sizes and Temperatures
Advisor: Christopher A. Schuh

Chulalongkorn University 2014 – 2018
B. Eng. in Metallurgical and Materials Engineering
Thesis Title: Numerical Simulation of Titanium Dental Casting
Advisor: Chedtha Puncreobutr

Current Research Interests

My research goals are to provide a better understanding of defect structure-property relationships through accelerated modeling and simulations, and to provide materials defect genomes with a focus on defect-defect interactions. The ultimate aim is to apply the accelerated computational frameworks and genomic databases for discovery and design of engineering materials via defect engineering.

Publications

Peer-reviewed:

1. **Tuchinda, N.** and Schuh, C.A., 2024. Triple junction excess energy in polycrystalline metals. *Acta Materialia*, *279*, p.120274. https://doi.org/10.1016/j.actamat.2024.120274.
2. Reichmann, A., **Tuchinda, N.**, Dösinger, C., Scheiber, D., Razumovskiy, V.I., Peil, O., Matson, T.P., Schuh, C.A. and Romaner, L., 2024. Grain boundary segregation for the Fe-P system: Insights from atomistic modeling and Bayesian inference. *Acta Materialia*, *279*, p.120215. https://doi.org/10.1016/j.actamat.2024.120215.
3. **Tuchinda, N.** and Schuh, C.A., 2024. Computed entropy spectra for grain boundary segregation in polycrystals. *npj Computational Materials*, *10*(1), p.72., https://dx.doi.org/10.21203/rs.3.rs-3712553/v1
4. **Tuchinda, N.** and Schuh, C.A., 2023. The vibrational entropy spectra of grain boundary segregation in polycrystals. *Acta Materialia*, *245*, p.118630., https://doi.org/10.1016/j.actamat.2022.118630
5. **Tuchinda, N.** and Schuh, C.A., 2023. Triple junction solute segregation in Al-based polycrystals. *Physical Review Materials*, *7*(2), p.023601. (Editors' Suggestion), https://doi.org/10.1103/PhysRevMaterials.7.023601
6. **Tuchinda, N.** and Schuh, C.A., 2022. Grain size dependencies of intergranular solute segregation in nanocrystalline materials. *Acta Materialia*, *226*, p.117614., https://doi.org/10.1016/j.actamat.2021.117614
7. Khamkongkaeo, A., Boonchuduang, T., Klysubun, W., Amonpattaratkit, P., Chunate, H. -thaichnok, **Tuchinda, N.**, Pimsawat, A., Daengsakul, S., Suksangrat, P., Sailuam, W., 2021. Sintering behavior and mechanical properties of hydroxyapatite ceramics prepared from Nile Tilapia (Oreochromis niloticus) bone and commercial powder for biomedical applications. Ceramics International 47, 34575–34584, https://doi.org/10.1016/j.ceramint.2021.08.372
8. Khamkongkaeo, A., Bootchanont, A., Klysubun, W., Amonpattaratkit, P., Boonchuduang, T., **Tuchinda, N.**, Phetrattanarangsi, T., Nuntawong, N., Kuimalee, S., Lohwongwatana, B., 2019. Effect of phosphate compound on physical and mechanical properties of SiO2 ceramic. Ceramics International 45, 1356–1362, https://doi.org/10.1016/j.ceramint.2018.07.253

Preprints:

1. **Tuchinda, N.**, Li, C. and Schuh, C.A., 2025. The Augmented Potential Method: Multiscale Modeling Toward a Spectral Defect Genome. *arXiv preprint arXiv:2502.08014*. https://doi.org/10.48550/arXiv.2502.08014

2. **Tuchinda, N.** and Schuh, C.A., 2025. Grain Boundary Segregation Spectra from a Generalized Machine-learning Potential. *arXiv preprint arXiv:2502.08017*. https://doi.org/10.48550/arXiv.2502.08017
3. **Tuchinda, N.***, Olson, G.B. and Schuh, C.A., 2025. A Grain Boundary Embrittlement Genome for Substitutional Cubic Alloys. *arXiv preprint arXiv:2502.06531*. https://doi.org/10.48550/arXiv.2502.06531
4. **Tuchinda, N.***, Olson, G.B. and Schuh, C.A., 2025. Grain Boundary Segregation and Embrittlement of Aluminum Binary Alloys from First Principles. *arXiv preprint arXiv:2502.01579*. https://doi.org/10.48550/arXiv.2502.01579
5. **Tuchinda, N.**, Wagih, M. and Schuh, C.A., 2024. Interstitial Solute Segregation at Triple Junctions: Implications for the Hydrogen Storage Properties of Nanomaterials. *arXiv preprint arXiv:2411.18537*. https://doi.org/10.48550/arXiv.2411.18537

Conference Presentations

1. TMS 2025 (Oral presenter, accepted)
   Tuchinda, N., Wagih, M., Schuh, C.A., Triple Junction Interstitial Solute Segregation in Nanocrystalline Alloys

2. MRS Fall 2024 (Oral presenter) 2025
   Tuchinda, N., Schuh, C.A., Energetics of Triple Junctions in Polycrystalline Materials

3. MRS Spring 2024 (Oral presenter, invited) 2024
   Schuh, C.A., **Tuchinda, N.**, Matson, T., Wagih, M., Learning Grain Boundary Thermodynamic Spectra in Polycrystals

4. MRS Spring 2024 (Oral presenter) 2024
   Tuchinda, N., Schuh, C.A., Learning Grain Boundary Segregation Vibrational Spectra from Ni-based Polycrystals

5. TMS 2024 (Oral presenter) 2024
   Tuchinda, N., Schuh, C.A., Consequences of the Solute Vibrational Contribution in Grain Boundary Segregation

6. MRS Fall 2023 (Oral presenter) 2023
   Tuchinda, N., Schuh, C.A., Solutes at Triple Lines in Al-Based Nanostructured Alloys

4. GRC: Physical Metallurgy 2023 (Poster presenter) 2023
   Tuchinda, N., Schuh, C.A., Triple Junction Segregation Behavior and Design of Dilute Al-based Alloys

5. TMS 2023 (Oral presenter) 2023
   Tuchinda, N., Schuh, C.A., Rapid machine learning estimation of grain boundary segregation vibrational entropy spectra in dilute polycrystals

6. MRS Fall 2022 (Oral presenter) 2022
   Tuchinda, N., Schuh, C.A., Spectrum of Grain Boundary Segregation Vibrational Entropy in Dilute Ni(Pd) Polycrystals

7. TMS 2022 (Oral presenter) 2022
   Tuchinda, N., Schuh, C.A., Contributions of Triple Junctions and Quadruple Nodes to Grainsize Dependent Intergranular Segregation

8. The 11th Thailand Metallurgy Conference (Oral presenter) 2018
   Tuchinda, N., Wanmanomai, P., Puncreobutr, C., Cellular Automaton Modeling of Dendritic Growth During Alloy Solidification

9. MRS Thailand 2017 (Oral presenter) 2017
   Tuchinda, N., Kowong, R., Chananonnawathorn, C., Horprathum, M., Khamkongkaeo, A. Lohwongwatana, B., An investigation on effects of N_2 partial pressure on structural, morphological, and mechanical properties of CrN film fabricated by RF reactive magnetron sputtering technique

Work Experience

1. Postdoctoral Associate at Massachusetts Institute of Technology 2023 - Present
2. Research Assistantship at Massachusetts Institute of Technology 2020 - 2023
3. Research Assistantship at Chulalongkorn University 2018 - 2019
4. Summer Internship at National Electronic and Computer Technology Center Summer 2017

Teaching and Mentoring

Teaching Training:

1. MIT Department of Materials Science and Engineering Minor in Teaching
2. MIT Graduate Teaching Certificate
3. Summer 2021 CIRTL Network MOOC, An Introduction to Evidence-Based Undergraduate STEM Teaching

Teaching Assistantship:

1. MIT: 3.030 Teaching Intern (Rated 6.8/7.0) — Fall 2022
   Instructor: Prof. Geoffrey S. Beach
2. MIT: 3.030 Teaching Intern (Rated 6.4/7.0) — Fall 2021
   Instructor: Prof. Juejun Hu
3. Undergraduate Teaching Assistant, Solidification of Casting — 2018
   Instructor: Prof. Chedtha Puncreobutr
4. Undergraduate Grader, Materials Characterization — 2018
   Instructor: Prof. Boonrat Lohwongwatana

Mentorship

1. Chang-hee Cho, Ph.D. Student, Schuh Group, Northwestern University
2. Yu-ning Chiu, Ph.D. Student, Schuh Group, Northwestern University

Professional and Community Services

1. Manuscript Reviewer (such as Acta Materialia, Computational Materials Science and JVST: A)
2. TMS Chemistry & Physics of Materials Committee Member
3. Volunteer staff, Pay it Forward 3D Printer (High school 3D printing outreach program) — 2018
4. Volunteer staff, The 1st Bangkok Symposium on Jewelry Manufacturing Technology — 2017

Awards and Fellowships

1. Julian Szekely Fellowship (MIT DMSE 1st-year fellowship) — 2019
2. Anandamahidol Foundation Scholarship: Engineering Division — 2019 - 2023
3. Undergraduate Metallurgical and Materials Engineering Scholarship — 2015 - 2018