

# Tyler H. Chang – CV

Numerical Optimization and Scientific Machine Learning, Senior Research Engineer

Mountain View, CA, USA

<https://thchang.github.io> <https://github.com/thchang>

## INTERESTS

Numerical optimization, scientific machine learning, high-performance and parallel computing, and open source software

## EXPERIENCE

- Jun 2024 - Present. **Senior Research Engineer: Siemens Digital Industry Software**, EDA / HAV Division
- Jun 2020 - May 2024. **Postdoctoral appointee: Argonne National Laboratory**, MCS Division
- Aug 2016 - May 2020. **Research fellow: Virginia Tech**, Dept. of Computer Science
- Feb 2016 - Aug 2016. **Research assistant: Old Dominion University**, Dept. of Computer Science

## EDUCATION

Ph.D., May 2020, Computer Science, Virginia Polytechnic Institute & State University (Virginia Tech)

B.S., May 2016, Computer Science & Mathematics (double-major), Virginia Wesleyan University, *summa cum laude*

## PUBLICLY AVAILABLE SOFTWARE

4. 2022 (latest release 2024). ParMOO: Python library for parallel multiobjective simulation optimization. Release: 0.4.1  
Devs: **T. H. Chang** (lead), S. M. Wild, and H. Dickinson<sup>1</sup> Primary Prog. Lang: **Python 3**  
**git:** <https://github.com/parmoo/parmoo>
3. 2020 (latest release 2024). DelaunaySparse: Interpolation via a sparse subset of the Delaunay triangulation.  
Devs: **T. H. Chang** (lead), T. C. H. Lux, and L. T. Watson Primary Prog. Lang: **Fortran 2003**  
**git:** <https://github.com/vtopt/DelaunaySparse>
2. 2022. VTMOOP: Solver for blackbox multiobjective optimization problems.  
Devs: **T. H. Chang** (lead) and L. T. Watson Primary Prog. Lang: **Fortran 2008**  
**git:** <https://github.com/vtopt/VTMOOP>
1. 2019. QAML: Quantum annealing math library.  
Devs: T. C. H. Lux (lead), **T. H. Chang**, and S. S. Tipirneni Primary Prog. Lang: **Python 3**  
**git:** <https://github.com/tchlux/qaml>

## PUBLICATIONS (FROM 28 PEER-REVIEWED WORKS)

5. 2025. **T. H. Chang** and S. M. Wild. Designing a framework for solving multiobjective simulation optimization problems. *To appear in INFORMS Journal on Computing*, 33 pages. Preprint: <https://arxiv.org/abs/2304.06881>.
4. 2025. **T. H. Chang**, A. K. Gillette, and R. Maulik. Leveraging interpolation models and error bounds for verifiable scientific machine learning. *Journal of Computational Physics* 524, Article 113726, 23 pages. **doi:** 10.1016/j.jcp.2025.113726
3. 2023. **T. H. Chang** and S. M. Wild. ParMOO: a Python library for parallel multiobjective simulation optimization. *Journal of Open Source Software* 8(82), Article 4468, 5 pages. **doi:** 10.21105/joss.04468
2. 2022. **T. H. Chang**, L. T. Watson, J. Larson, N. Neveu, W. I. Thacker, S. Deshpande, and T. C. H. Lux. Algorithm 1028: VTMOOP: Solver for blackbox multiobjective optimization problems. *ACM Transactions on Mathematical Software* 48(3), Article 36, 34 pages. **doi:** 10.1145/3529258
1. 2020. **T. H. Chang**, L. T. Watson, T. C. H. Lux, A. R. Butt, K. W. Cameron, and Y. Hong. Algorithm 1012: DELAUNAYSPARSE: Interpolation via a sparse subset of the Delaunay triangulation in medium to high dimensions. *ACM Transactions on Mathematical Software* 46(4), Article 38, 20 pages. **doi:** 10.1145/3422818

<sup>1</sup>= DOE SULI (undergraduate intern) at Argonne in my supervision

## Research Funding Raised

3. Declined for FY 2024. **Key contributor**, \$400K/y for 1 year. *High performance computing for development of critical thermodynamic inputs for next generation thermal barrier coatings*, external grant
2. Mar 2023 - Sep 2023. **Co-PI**, \$50K/y for 1 year. *A Scalable Multi-Physics Optimization Framework for Particle Accelerator Design*, institutional seed funding (LDRD 2023-0246)
1. Jun 2019 - Dec 2019. **Primary awardee**, \$3K/mo for 6 months. *An Adaptive Weighting Scheme for Multiobjective Optimization*, DOE award for PhD students (DE-SC0014664)

## Research Fellowships Awarded

5. Aug 2016 - May 2020. Cunningham Doctoral Fellowship, Virginia Tech, Graduate School, guaranteed research funding
4. Aug 2019 - May 2020. Davenport Leadership Fellowship, Virginia Tech, College of Engineering, \$4k supplemental award
3. Aug 2018 - May 2019. Pratt Fellowship, Virginia Tech, College of Engineering, \$4k supplemental award
2. Aug 2017 - May 2018. Pratt Fellowship, Virginia Tech, College of Engineering, \$4k supplemental award
1. Aug 2016 - May 2017. Davenport Leadership Fellowship, Virginia Tech, College of Engineering, \$4k supplemental award

## Misc. Awards and Accomplishments

4. Jan 2021. Nominee for Outstanding Dissertation Award, Virginia Tech, Graduate School
3. Apr 2016. Outstanding Student in Computer Science & Mathematics, Virginia Wesleyan University
2. Feb 2016. ACM International Collegiate Programming Competition (ICPC), winning team for CNU site, VA, USA
1. Feb 2015. ACM International Collegiate Programming Competition (ICPC), winning team for CNU site, VA, USA

## Interns Advised

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| Jun 2022 - Aug 2022. | Manisha Garg (UIUC), NSF MSGI (PhD student intern) at Argonne      |
| Jun 2022 - Aug 2022. | Hyrum Dickinson (UIUC), DOE SULI (undergraduate intern) at Argonne |

## Teaching

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| Jan 2022 - Feb 2024. | <b>Adjunct Professor: College of DuPage</b> , Dept. of Computer and Info. Science (Intro to Python)     |
| Jan 2020 - May 2020. | <b>Instructor of Record: Virginia Tech</b> , Dept. of Computer Science (Data structures and algorithms) |

## Journal / Conference Referee

Optimization Methods and Software (2025–Present); Journal of Supercomputing (2024–Present); INFORMS Journal on Computing (2023–Present); ACM Transactions on Mathematical Software (2021–Present); Quantum Information Processing (2021–Present); The Visual Computer Journal (2021); MDPI: Mathematical and Computer Applications (2021); Journal of Machine Learning Research (2019); ICIAM (2023); Supercomputing (2021); IEEE SoutheastCon (2018–2020)

## Minisymposium Organizer

Multiobjective Optimization Software track in SIAM Conference on Optimization (2021); Geometric Methods for Machine Learning track in SIAM Conference on Computational Science and Engineering (2021)