VO THANH PHAT B.S., M.A., Ph.D.

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Employment

August 2024-current	**Tenure-Track Assistant Professor,** Department of Mathematics and Statistics, University of North Dakota, North Dakota, USA.
September 2019 – August 2024	**Graduate Rumble Fellow, and Graduate Assistant,** Department of Mathematics, Wayne State University, Michigan, USA.
October 2018 – September 2019	**Lecturer,** Department of Mathematics and Informatics, Ho Chi Minh City University of Education, Ho Chi Minh City, Vietnam.

Education

September 2019 - August 2024	**Doctor of Philosophy in Applied Mathematics** at Wayne State University, USA. Doctoral Advisor: *Boris S. Mordukhovich*
September 2019 - May 2021	**Master's Degree in Applied Mathematics** at Wayne State University, USA.
September 2014 – June 2018	**Bachelor's Degree in Mathematics Teacher Education** at Ho Chi Minh City University of Education, Vietnam. Thesis advisor: *Pham Duy Khanh*.

Research Interest

My main research areas are nonsmooth optimization and variational analysis. I am interested in both theoretical and numerical aspects with applications in machine learning and statistics. To provide further clarity, my research projects can be categorized into three distinct parts:

1) **Qualitative Research:** optimality conditions for nonsmooth optimization problems, properties of generalized convexity and monotonicity, stability, regularity, etc.

2) **Quantitative Research:** generalized first- and second-order numerical methods for solving nonsmooth nonconvex optimization problems including unconstrained optimization problems, constrained optimization problems, composite optimization problems, difference programming, bilevel optimization, stochastic optimization, etc.

3) **Applications:** applying aforementioned results in qualitative and quantitative studies for real practical optimization problems such as LASSO, fast best subsets selection, support vector machine, quadratic programming, clustering problems, minimax problems, etc.

Research Publications

Peer-Reviewed Publications:

1) P. D. Khanh, V. V. H. Khoa, B. S. Mordukhovich, <u>V. T. Phat</u>, *Local Minimizers of Nonconvex Functions in Banach Spaces via Moreau Envelopes*, accepted in **Vietnam Journal of Mathematics**, arXiv:2311.18586.

2) P. D. Khanh, V. V. H. Khoa, B. S. Mordukhovich, <u>V. T. Phat</u>, *Local maximal monotonicity in variational analysis and optimization*, accepted in **Mathematics of Operations Research**, arXiv:2308.14193.

3) P. D. Khanh, B. S. Mordukhovich, <u>V. T. Phat</u>, D. B. Tran, *Inexact proximal method for weakly convex functions*, accepted in **Journal of Global Optimization**, arXiv:2307.15596.

4) P. D. Khanh, V. V. H. Khoa, B. S. Mordukhovich, <u>V. T. Phat</u>, *Variational and strong variational convexity in infinite-dimensional variational analysis*, accepted in **SIAM Journal on Optimization**, arXiv:2308.14193 (2024).

5) P. D. Khanh, B. S. Mordukhovich, <u>V. T. Phat</u>, D. B. Tran, *Globally convergent coderivative-based generalized Newton methods in nonsmooth optimization*, **Mathematical Programming**, 205 (1), 373–429 (2024).

6) P. D. Khanh, B. S. Mordukhovich, <u>V. T. Phat</u>, *Variational convexity of functions and variational sufficiency in optimization*, **SIAM Journal on Optimization**, 33 (2), 1121–1158 (2023).

7) P. D. Khanh, B. S. Mordukhovich, <u>V. T. Phat</u>, D. B. Tran, *Generalized damped Newton algorithms in nonsmooth optimization via second-order subdifferentials*, **Journal of Global Optimization**, 86 (1), 93–122 (2023).

8) P. D. Khanh, B. S. Mordukhovich, <u>V. T. Phat</u>, *A generalized Newton method for subgradient systems*, **Mathematics of Operations Research**, 48 (4), 1811–1845 (2023).

9) P. D. Khanh, <u>V. T. Phat</u>, *Second-order characterizations of quasiconvexity and pseudoconvexity for differentiable functions with Lipschitzian derivatives.* **Optimization Letters. 14**, 2413–2427 (2020).

10) P. D. Khanh, <u>V. T. Phat</u>, *Second-order characterizations of C^1-smooth robustly quasiconvex functions.* **Operations Research Letters. 46**, 568–572 (2018).

Books and Chapters:

1) P. D. Khanh, V. V. H. Khoa, B. S. Mordukhovich, <u>V. T. Phat</u>, *Variational convexity of functions in Banach spaces*, (J. M. Amigo et al., eds), **Springer Proceedings in Mathematics and Statistics** (M.J. Canovas et al., eds), 424, pp. 237–260, link, Springer (2023).

Submitted Manuscripts:

1) P. D. Khanh, B. S. Mordukhovich, <u>V. T. Phat</u>, *Coderivative-Based Newton Methods in Structured Nonconvex and Nonsmooth Optimization*, submitted to **Mathematical Programming**, arXiv:2311.18586.

2) P. D. Khanh, V. V. H. Khoa, B. S. Mordukhovich, <u>V. T. Phat</u>, *Second-Order Subdifferential Optimality Conditions in Nonsmooth Optimization*, submitted to **SIAM Journal on Optimization**, arXiv:2312.16277.

Skills

Languages	▐	Vietnamese (Native), English (Professional Proficiency)
Coding	▐	Matlab, Python, LaTeX
Teaching Software	▐	Geogebra, Google Meet, Teams, Zoom
Educational Platforms	▐	Canvas, Cengage, Hawkes Learning, MyLab & Mastering
Others	▐	Octave, Wolfram Alpha, Overleaf

Professional Services

Journal Reviewer

I am a referee for journals including:

- Applied Mathematics and Optimization

- Journal of Optimization Theory and Applications

- Journal of Global Optimization

- Optimization

- SIAM Journal on Optimization

Here is my ORCID ID profile: https://orcid.org/0000-0003-1211-8025.

Professional Membership

I am a member of:

- American Mathematical Society

- International Working Group on Generalized Convexity

- Society for Industrial and Applied Mathematics (SIAM)

Teaching

Wayne State University, Detroit, Michigan, USA

Spring/Summer 2024		**MAT 2020**, *Calculus II*
Winter 2023		**MAT 1800**, *Elementary Functions*
Fall 2022		**MAT 0993**, *Beginning Algebra*
Winter 2022		**STA 1020**, *Elementary Statistics*
Fall 2021		**MAT 2010**, *Calculus I*

Ho Chi Minh City University of Education, Ho Chi Minh, Vietnam

Summer 2023		**MATH 1408**, *Theory of Linear Optimization*
Summer 2022		**MATH 1408**, *Theory of Linear Optimization*
Spring 2019		**MAT 1437**, *Theory of Nonlinear Optimization*

Research Funding

My research projects were partly supported by the following grants:

Miscellaneous Experience

Awards and Achievements

2023	Thomas C. Rumble Fellowship: only two graduate students in the department receives this award per academic year (tuition fee, insurance and stipend are covered).
	Graduate Student Professional Travel Awards for SIAM Conference on Optimization, Graduate School, Wayne State University.
	The William Martin Borgman Endowed Scholarship for Mathematics, Department of Mathematics, Wayne State University.
2022	Travel Award for the 9th Heidelberg Laureate Forum, Heidelberg, Germany.
	Graduate Student Professional Travel Awards for the 24th Midwest Optimization Meeting, Graduate School, Wayne State University.
	The M.F. Janowitz Endowed Mathematics Scholarship, Department of Mathematics, Wayne State University.
	The William Martin Borgman Endowed Scholarship for Mathematics, Department of Mathematics, Wayne State University.
	Outstanding Graduate Student at Wayne State University: only one graduate student in each department receives this award per academic year.
2021	The M.F. Janowitz Endowed Mathematics Scholarship, Department of Mathematics, Wayne State University.
2020	The M.F. Janowitz Endowed Mathematics Scholarship, Department of Mathematics, Wayne State University.

Conferences Attended

February 28, 2024	*The 14th Annual Graduate Research Symposium.* Hosted by Wayne State University, Michigan, Detroit, USA.
October 21 - 22, 2023	*The 25th Midwest Optimization Meeting.* Hosted by the University of Michigan, Ann Arbor, Michigan, USA.
August 7 - August 12, 2023	*10th Vietnam Mathematical Congress 2023 (VMC-2023).* Hosted by the University of DaNang - University of Science and Education, Da Nang, Vietnam.
July 12 - July 15, 2023	*International Conference on Optimization and Variational Analysis with Applications 2023 (ICOVAA-2023).* Hosted by Vietnam Institute for Advanced Study in Mathematics (VIASM), Hanoi, Vietnam.

Miscellaneous Experience (continued)

May 31 - June 3, 2023	■ *SIAM Conference on Optimization (OP23).* Hosted by the University of Washington, Seattle, Washington, USA.
October 28 - 29, 2022	■ *The 24th Midwest Optimization Meeting and Workshop on Large Scale Optimization and Applications.* Hosted by the University of Waterloo, Ontario, Canada.
September 18–23, 2022	■ *9th Heidelberg Laureate Forum 2022.* Hosted in Heidelberg, Germany.
September 13-16, 2022	■ *XIII International Symposium on Generalized Convexity and Monotonicity (GCM XIII).* Hosted by the International Working Group on Generalized Convexity (Online).
March 8 - 10, 2022	■ *The 12th Annual Graduate Research Symposium.* Hosted by Wayne State University, Michigan, Detroit, USA.
October 29 - 30, 2021	■ *The 23rd Midwest Optimization Meeting (In memory of Professor Asen Dontchev (1948-2021)).* Hosted by Grand Valley State University, Allendale, Michigan, USA.
March 1 - 5, 2021	■ *The 11th Annual Graduate Research Symposium.* Hosted by Wayne State University, Michigan, Detroit, USA.