

Cunlu Zhou

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RESEARCH INTERESTS	quantum computing, optimization, machine learning, complexity theory, and connections with physics	
APPOINTMENTS HELD	Current: 01/2026– IBM Quantum Research Chair, Université de Sherbrooke, QC 09/2025– Associate Academic Member, Mila – Quebec AI Institute, QC 11/2024– Member, Institut quantique, Université de Sherbrooke, QC 08/2024– Assistant Professor of Computer Science, Université de Sherbrooke, QC Past: 08/2021– FRHTP Postdoctoral Fellow, Center for Quantum Information and Control, University of New Mexico, Albuquerque, NM 2020–2021 Postgraduate Affiliation, Vector Institute, Toronto, ON 07/2019– Postdoctoral Fellow in Computer Science, University of Toronto, ON 07/2021 Supervisor: Henry Yuen	
EDUCATION	University of Notre Dame Notre Dame, IN, USA Ph.D. in Mathematics May 2019 • Dissertation Title: <i>Entropy, Optimization, and Coding Theory</i> • Advisors: Roxana Smarandache and Leonid Faybusovich Capital Normal University Beijing, China M.S. in Mathematics June 2012 • Thesis: <i>A Remark on Calc. Var. Partial Differential Equations, 329-344 (2002)</i> • Advisor: Zhaoli Liu Chongqing Normal University Chongqing, China B.A. in Mathematics June 2009	
HONORS AND AWARDS	2026–2031 2021–2024 2020–2021 2009–2012	IBM Quantum Research Chair (\$575,000 CAD over 5 years) NSF FRHTP Postdoctoral Fellowship (~\$70,000 USD per year) Center for Quantum Information and Control, University of New Mexico, Albuquerque, NM, USA Postgraduate Affiliate Award (\$12,000 CAD) Vector Institute, Toronto, ON, Canada University Scholarships Capital Normal University, Beijing, China
PUBLICATIONS	Yi, C. and Zhou, C. , <i>Ancilla-Free Quantum Protocol for Thermal Green's Functions</i> , arXiv:2509.03288, Sep. 2025. Submitted. Yi, C., Zhou, C. , and Takahashi, J., <i>Quantum Phase Estimation by Compressed Sensing</i> , Quantum 8 , 1579, Dec. 2024. doi:10.22331/q-2024-12-27-1579	

Takahashi, J., Rayudu, C., **Zhou, C.**, King, R., Thompson, K., and Parekh, O., *An $SU(2)$ -Symmetric Semidefinite Programming Hierarchy for Quantum Max Cut*, arXiv:2307.15688, Jul. 2023. Accepted to TQC 2024. Submitted.

Wiersema, R., **Zhou, C.**, Carrasquilla, J. F., and Kim, Y. B., *Measurement-induced entanglement phase transitions in variational quantum circuits*, SciPost Phys. **14**, 147, Jun. 2023. doi:10.21468/SciPostPhys.14.6.147

Wiersema, R., **Zhou, C.**, de Sereville, Y., Carrasquilla, J. F., Kim, Y. B., and Yuen, H., *Exploring entanglement and optimization within the Hamiltonian Variational Ansatz*. PRX Quantum **1**, 020319, Dec. 2020. doi:10.1103/PRXQuantum.1.020319

Faybusovich, L. and **Zhou, C.**, *Long-Step Path-Following Algorithm in Quantum Information Theory: Some Numerical Aspects and Applications*, Numerical Algebra, Control & Optimization, 12(2):445-467, Jun. 2022. doi:10.3934/naco.2021017

Faybusovich, L. and **Zhou, C.**, *Self-Concordance and Matrix Monotonicity with Applications to Quantum Entanglement Problems*, Applied Mathematics and Computation, 375:125071, Jun. 2020. doi:10.1016/j.amc.2020.125071

Faybusovich, L. and **Zhou, C.**, *Long-Step Path-Following Algorithm for Solving Symmetric Programming Problems with Nonlinear Objective Functions*, Comput Optim Appl, 72(3):769-795, Apr. 2019. doi:10.1007/s10589-018-0054-7

Zhou, C., Mitchell, D. G. M., and Smarandache, R., *Free Pseudodistance Growth Rates for Spatially Coupled LDPC Codes over the BEC*, 2018 IEEE Information Theory Workshop (ITW), pp. 1-5, Guangzhou, 2018. doi:10.1109/ITW.2018.8613507

PRESENTATIONS

Quantum Phase Estimation by Compressed Sensing, Algorithms for Quantum Advantage Workshop, Montréal, QC, Jul. 2025 (invited talk)

Advancing Quantum Algorithm Development in Québec, Quantum Forum 2025, Troy, NY, Apr. 2025 (Keynote)

Quantum Phase Estimation by Compressed Sensing, 10th International Conference on Quantum Information and Quantum Control, The Fields Institute, Toronto, Ontario, Aug. 2024 (talk)

Algorithms, Complexity, and Quantum Many-body Physics, University of Calgary, Calgary, Alberta, Apr. 18, 2024 (talk)

Algorithms, Complexity, and Quantum Many-body Physics, University of Pittsburgh, Pittsburgh, PA, Mar. 4, 2024 (talk)

Algorithms, Complexity, and Quantum Many-body Physics, Université de Montréal, Montréal, Québec, Feb. 28, 2024 (talk)

Some recent results on Quantum Phase Estimation and Quantum MaxCut, University of Miami, Coral Gables, FL, Feb. 9, 2024 (talk)

Some recent results on Quantum Phase Estimation and Quantum MaxCut, Université de Sherbrooke, Sherbrooke, Québec, Jan. 22, 2024 (talk)

Quantum Phase Estimation by Compressed Sensing, Quantum Days 2024, Calgary,

AB, Feb. 2024 (poster)

An $SU(2)$ -Symmetric Semidefinite Programming Hierarchy for Quantum MaxCut, IPAM UCLA, Los Angeles, CA, Nov. 2023 (poster)

Quantum Phase Estimation by Compressed Sensing, SQUINT2023, Albuquerque, NM, Oct. 2023 (poster)

An $SU(2)$ -Symmetric Semidefinite Programming Hierarchy for Quantum MaxCut, Université de Sherbrooke, Sherbrooke, Québec, Oct. 2023 (invited talk)

Quantum Phase Estimation by Compressed Sensing, INTRIQ Meeting, Bromont, Quebec, Oct. 2023 (poster)

Quantum Phase Estimation by Compressed Sensing, APQC Workshop, Estes Park, Colorado, Oct. 2023 (poster)

An $SU(2)$ -Symmetric Semidefinite Programming Hierarchy for Quantum MaxCut, 2023 Modeling and Optimization: Theory and Applications (MOPTA), Lehigh University, Bethlehem, Pennsylvania, Aug. 2023 (talk)

A singlet projector based NPA hierarchy for the Quantum MaxCut problem, Vector Institute, Toronto, Jun. 2023 (invited talk)

A singlet projector based NPA hierarchy for the Quantum MaxCut problem, 2023 CMS Summer Meeting, Ottawa, Jun. 2023 (invited talk)

Entanglement and optimization within the Hamiltonian Variational Ansatz, Fermilab, Batavia, IL, Jan. 2021 (invited talk)

Entanglement and optimization within the Hamiltonian Variational Ansatz, Dahlem Center for Complex Quantum Systems, Freie Universität Berlin, Berlin, Dec. 2020 (invited talk)

Entanglement and optimization within the Hamiltonian Variational Ansatz, 2020 Quantum Techniques in Machine Learning (QTML), Cambridge, Massachusetts, Nov. 2020 (invited talk)

A Long-Step Path-Following Algorithm for Quantum Entropy Optimization, IQC, Waterloo, Jan. 2019 (invited talk)

Long-Step Path-Following Algorithm for Nonlinear Symmetric Problems with Applications to Quantum Entropy Optimization, 2019 Joint Mathematics Meetings (JMM), Baltimore, Maryland, Jan. 2019 (talk)

Free Pseudodistance Growth Rates for Spatially Coupled LDPC Codes over the BEC, 2018 IEEE Information Theory Workshop (ITW), Guangzhou, Nov. 2018 (talk)

Long-Step Path-Following Algorithm for Nonlinear Symmetric Programming Problems, 23rd International Symposium on Mathematical Programming (ISMP), University of Bordeaux, Bordeaux, Jul. 2018 (talk)

EXTENDED PROFESSIONAL TRAVEL	November 2023	Institute for Pure and Applied Mathematics, Los Angeles, USA
	October 2023	Vector Institute, Toronto, Canada
	February 2022	Kavli Institute for Theoretical Physics, Santa Barbara, USA
	February 2020	Simons Institute for the Theory of Computing, Berkeley, USA
	December 2019	Israel Institute for Advanced Studies, Jerusalem, Israel
	Summer 2018	IBM Research Lab, Dublin, Ireland
	October 2015	Mathematical Coding Theory in Multimedia Streaming, Banff International Research Station (BIRS), Banff, Canada
	Summer 2015	École Polytechnique Fédérale de Lausanne, Lausanne, Switzerland
ADVISEES	PhD	Alexandre Leblanc (co-advised with Stefanos Kourtis. Fall 2025 –)
	MSc	Julien-Pierre Houle (co-advised with Alexandre Blais. Fall 2025 –)
	UG	Elisabeth Mailhot(co-advised with Dave Touchette. Summer 2025)
	UG	Ludovic Chabot Provencher (co-advised with Dave Touchette. Summer 2025)
	UG	Mathis Beaudoin (co-advised with Dave Touchette. Summer 2025)
	UG	Louis-Félix Vigneux (Summer 2025)
TEACHING EXPERIENCE	Université de Sherbrooke:	
	Summer 2025	Instructor, Topics in Quantum Algorithms
	University of New Mexico:	
	Summer 2024	Instructor, Optimization and Quantum Foundations
	University of Notre Dame:	
	Spring 2018	Teaching Assistant, Calculus III
	Spring 2017	Instructor, Calculus B
	Fall 2016	Teaching Assistant, Linear Algebra and Differential Equations
	Spring 2015	Teaching Assistant, Linear Algebra and Differential Equations
	Fall 2014	Teaching Assistant, Linear Algebra and Differential Equations
SERVICE	Spring 2014	Teaching Assistant, Calculus B
	Fall 2013	Teaching Assistant, Calculus B
	Université de Sherbrooke	
	10/2025–	Planning & Scientific Committee, Canadian Workshop on Quantum Algorithms (2026)
	08/2025–	Local Organizing Committee, Theory of Quantum Computation, Communication and Cryptography (TQC 2026)
	05/2025–	Management Committee, AlgoLab
	01/2025–	Organizer, Quantum Algorithms Research Seminar (QARS)
	12/2024–	Scientific Committee, Quantum Algorithms Summer School (2026)
	University of New Mexico	
	2023	Organizer, CQuIC Seminar
	2022	Organizer, SDP & Approximation Algorithms Seminar
	2022	Program Committee, Southwest Quantum Information and Technology (SQuInT 2022)

REFERENCES

Roxana Smarandache (Ph.D. advisor), Professor

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University of Notre Dame, Notre Dame, IN, USA
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