Brian Coffey
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DEGREE EDUCATION

University of California Berkeley *Ph.D., Architecture* 2011
Major: Building Science, Minors: Control Theory, Operations Research, Second Language: French
Dissertation: 'Using Building Simulation and Optimization to Calculate Lookup Tables for Control'

Concordia University (Montreal) *M.A.Sc., Building Engineering* 2008
Thesis: 'A Development and Testing Framework for Simulation-Based Supervisory Control With Application
to Optimal Zone Temperature Ramping Demand Response Using a Modified Genetic Algorithm'

U. of Victoria (BC, Canada) *B.Eng (incomplete), Mechanical Engineering* 2002-2005

McMaster University *B.A.Sc.{Hon}, Arts & Science* 2003
Thesis: 'Fuel Cells in Context, 1800-1980: Towards a History of the Technology and its Shaping Influences'

CONTINUING EDUCATION

Stanford University	Graduate Certificate in Statistics	2021-2022
MITx	MicroMasters in Supply Chain Management	2020-2021
Insight Data Science	Data Science Leader	2017
	Data Science Fellow	2015
Harvard Business School Online	CORe: Credential of Readiness	2016
Coursera	Specialization in Business Fundamentals (UPenn Wharton)	2016
	Specialization in Data Science (Johns Hopkins)	2014-2015
	Add'l courses: Machine learning, Algorithms (Stanford)	2014-2015
Oxford University Cont. Ed.	Courses: Intro Microeconomics, Intro Macroeconomics	2014

EMPLOYMENT

Stitch Fix *Software Architect* London, UK, Jun 2022 – Dec 2022
Scoped data science and engineering work required for further international expansion at the request of the CTO. Advised UK leadership on issues related to the company's technical systems. Discovered and fixed an issue with a key recommendation system, unlocking significant improvements for the UK business, including a 2-4% increase in revenue and similar decreases in future operational expenses.

Interim Leader of Operations Algorithms Remote, US, Feb 2022 – Jun 2022
Director-level role, reported first to the VP of Data Science & ML and then directly to the CTO, managed three managers, established the long-term vision and next-quarter priorities for the function, and helped coordinate the search for and transition to a permanent leader before moving to the UK.

Manager of Data Science Remote, US, Mar 2020 - Feb 2022
Managed a team of 4 data scientists through a period of significant organizational change: evolved team charter, decommissioned legacy projects, recruited and hired 2 new scientists. Developed a new method to assess stylist efficiency and helped to guide a major cross-functional effort to bring it to production, which unblocked a major company initiative (Fix Preview). Identified the need, established stakeholder alignment, developed the technical roadmap, and managing the delivery of a major update to the stylist task assignment service, which is in the critical path for stylist labor and which increases revenue by >$10 million/yr by optimal matching.

Data Scientist SF Aug 2015-Aug 2016, Remote (contractor) Sep 2016-Oct 2017, SF May 2018-Mar 2020
Conceived and prototyped a photo-based clothing measurement system. Developed systems for planning stylist work volume and assessing stylist performance. Developed a system for streaming CX ticket categorization and automation, and developed a broader research agenda for continued development of CX algorithms. Developed algorithms-tour.stitchfix.com and cultivating-algos.stitchfix.com with the CAO(s).

Freelance *Consultant* Remote, global, various periods, 2012 - 2020
Software development and consulting in data science and architectural engineering. Clients have included Kinestral, Xerohome (Vistar Energy), Convergence Data Analytics, National University of Ireland Galway, UCL and LBNL. Founded and operated Texture Data & Design, Inc (2016-2018) to house some of this work.

Atelier Ten *Environmental Designer* SF & NY, 2010 - 2012, 2015
Performed custom analysis for a wide range of architectural design projects, developed in-house analysis tools and provided in-house training in building simulation and Python

Apidae Labs *Startup Team Member* Ithaca, NY, 2014 - 2015
Market analysis, MVP app design, customer discovery, graphic design and product development for a cloud-based building simulation and optimization platform

University College London *Principal Research Assoc.* London, UK, 2014
Developed a simulation-based model of the UK non-domestic building stock, with an innovative approach wherein physics-based models are automatically generated for every building in the stock, along with statistical techniques to project changes in the stock under different regulatory and technological scenarios

Lawrence Berkeley National Lab *Principal Scientific Eng. Assoc.* Berkeley, CA, 2013 - 2014
Graduate Student Researcher 2007 - 2009
Developed and tested practical approximations to optimal control for integrated control of building systems, worked with a team of experts to develop and test a Model Predictive Control implementation for the UC Merced chilled water system, performed detailed EnergyPlus studies of prototype designs, retrofits and controls for a large retail chain, and developed macro-scale models of energy consumption in the US commercial building stock

Public Works & Gov Services Can. *Research Assistant* Ottawa, Canada, 2004 - 2006
Developed and analyzed control strategies for distributed heat and power generation systems

ADVISORY ROLES AND AFFILIATE POSITIONS

Lawrence Berkeley National Lab *Affiliate* 2019 - 2020
Advised on the development of a high-fidelity dataset for building energy simulation algorithm validation using the FLEXLAB facility in the Environmental Energy Technologies Division

Xerohome (Vistar Energy) *Advisor* 2018 - 2020
Provided technical and business strategy advice for a startup that uses data analytics and building simulation to help homeowners get to net-zero energy and to help utilities target incentive programs. Previously, as a freelance consultant, developed their front end and designed and developed the engine for the MVP and initial client work. The project then secured DOE-SBIR funding and more client work; continued to advise as it iterated and scaled.

Atelier Ten *Research Associate* 2018
Providing training and project expertise related to cloud-based scripted and interactive architectural analysis

National Research Council (Canada) *Visiting Scholar* 2010
Developed a photometric model in Radiance for analysis of an innovative sunlighting system

AWARDS AND FELLOWSHIPS

National Science and Engineering Research Council PGS-D Scholarship	2009 - 2011
American Society of Heating, Refrigerating and Air-conditioning Eng. (ASHRAE) Grant-in-Aid	2009 - 2010
T.Y. Lin Prize for Architectural Engineering Research, UC Berkeley	2009
International Building Performance Simulation Association Canada Best Student Paper Award	2006
NATO Advanced Study Institute: Thermal Energy Storage for Sustainable Energy Consumption, Fellow	2005
Student of the Year Award, Nicholson Catholic College (secondary school, Belleville, Canada)	1997

PUBLICATIONS

Journal Articles

- Lee ES, Gehbauer C, Coffey B, McNeil A, Stadler M, Marnay, C. 'Integrated control of dynamic facades and distributed energy resources for energy cost minimization in commercial buildings' *Solar Energy* 122, 1384-1397, 2015.
- Coffey B. 'Approximating Model Predictive Control with Existing Building Simulation Tools and Offline Optimization' *J. of Building Performance Simulation*, 6(3), 220-235, 2013.
- Laouadi A, Coffey B. 'The Energy Performance of the Central Sunlighting System' *Journal of Building Performance Simulation*, 5(4), 234-247, 2012.
- Ma Y, Borrelli F, Hencey B, Coffey B, Bengea S, Haves P. 'Model Predictive Control for the Operation of Building Cooling Systems' *IEEE Trans. on Control Systems Technology*, 20(3), 796-803, 2012.
- Coffey B, Haghighat F, Morofsky E, Kutrowski E. 'A Software Framework for Model Predictive Control with GenOpt' *Energy and Buildings*, 42(7), 1084–1092, 2010.
- Coffey B, Borgeson S, Apte J, Mathew P, Haves P, Selkowitz S. 'Towards a Very Low Energy Building Stock: Modeling the US Commercial Building Sector to Support Policy and Innovation Planning' *Building Research & Information*, 37(5), 610 – 624, 2009.
- Komiyama R, Marnay C, Stadler M, Lai J, Borgeson S, Coffey B, Azevedo IL. 'Japan's Long-term Energy Demand and Supply Scenario to 2050 – Estimation for the Potential of Massive CO_2 Mitigation' *IEEJ Journal (The Inst. of Energy Economics, Japan)* 4(2), 2009.
- Coffey B, Kutrowski E. 'Demand charge considerations in the optimization of cogeneration dispatch in a deregulated energy market' *International Journal of Energy Research*, 30(7), 535-551, 2006.

Conference Papers

- Saxena M, Coffey B, May-Ostendorp P, Rasin J, Wilson E, Horowitz S. 'Simplifying Energy Efficiency for Homeowners – Results from a California Utility's Pilot Study of a Scalable Solution to Assess Retrofit and Solar Opportunities' *ACEEE Summer Study*, 2018
- Coffey B, Stone A, Ruyssevelt P, Haves P. 'An Epidemiological Approach to Simulation-Based Analysis of Large Building Stocks' *Proc. of IBPSA International*, 2015.
- Coffey B, Tuhus-Dubrow D, Munshi M. 'All the ways of meeting a target: Calculating a solution surface using GenOpt' *Proc. of SimBuild (IBPSA-USA)*, 2012.
- Munshi M, Tuhus-Dubrow D, An J, Coffey B. 'Practical Techniques for Automated Calibration of Existing Models for Use in Building Operations' *Proc. of SimBuild*, 2012.
- Nahman JE, Coffey B, Deringer J. 'Development of Open-Source Parametric EnergyPlus Models and their use for Savings Potential Analysis of Envelope Measures' *ACEEE Summer Study - Energy Efficiency in Buildings*, 2012.
- Coffey B. 'Using Building Simulation and Optimisation to Calculate Control Lookup Tables Offline' *Proc. of IBPSA International*, 2011.
- Coffey B, Haves P, Hencey B, Ma Y, Borrelli F, Bengea S. 'Development and Testing of Model Predictive Control for a Campus Chilled Water Plant with Thermal Storage' *ACEEE Energy Efficiency in Buildings*, 2010.
- Ma Y, Borrelli F, Hencey B, Coffey B, Bengea S, Haves P. 'Model Predictive Control for the Operation of Building Cooling Systems' *Proc. of the American Control Conference*, pp 5106-5111, 2010
- Marnay C, Borgeson S, Coffey B, Stadler M, Lai J, Komiyama R. 'A Buildings Module for the Stochastic Energy Deployment System' *ACEEE Summer Study - Energy Efficiency in Buildings*, 2008.
- Haves P, Coffey B, Williams S. 'Benchmarking and Equipment and Controls Assessment for a 'Big Box' Retail Chain' *ACEEE Summer Study - Energy Efficiency in Buildings*, 2008.
- Marnay C, Stadler M, Aki H, Coffey B, Firestone R, Lai J, Siddiqui. 'A Microgrid Selection and Operation for Commercial Buildings in California and New York States' *4th European PV-Hybrid and Mini-Grid Conference*, 2008.
- Coffey B, Kutrowski E. 'Effective Control of Combined Heating, Cooling and Power Systems in an Hourly-Price Electricity Market' *Proc. of Cold-Climate HVAC, Moscow*, 2006.
- Coffey B, Morofsky E, Haghighat F. 'Model-Based Control of Responsive Building Systems: A Summary of its Potential and Challenges' *Proc. of eSim (IBPSA-Canada)*, 2006.

Technical Reports (LBNL, US Department of Energy, California Energy Commission, etc)

- *[LBNL-1004337]* Lee ES, Coffey B, Fernandes LL, Hoffmann S, McNeil A, Thanachareonkit A, Ward GJ. 'High Performance Building Facade Solutions–Phase II', 2014.
- *[DOE / CEC PIER Technical Report]* Coffey B, McNeil A, Nouidui TS, Lee ES. 'Automated Production of Optimization-Based Control Logics for Dynamic Façade Systems, with Experimental Application to Two-Zone External Venetian Blinds', 2013 (rev 2022). https://eta-publications.lbl.gov/publications/automated-production-optimization
- *[LBNL-6023E]* Lee ES, Fernandes LL, Coffey B, McNeil A, Clear R, Webster T, Bauman F, Dickerhoff D, Heinzerling D, Hoyt T. 'A post-occupancy monitored evaluation of the dimmable lighting, automated shading, and underfloor air distribution system in The New York Times Building', 2013.
- *[DOE / CEC PIER Technical Report]* Coffey B. 'Integrated control of operable fenestration systems and thermally massive HVAC systems: Methods and simulation studies of energy savings potential', 2012. http://facades.lbl.gov/publications/integrated-control-operable
- *[DOE / CEC PIER Technical Report]* Coffey B, Lee E. 'Model-based controls for integrated shading and UFAD control: Report on initial studies', 2011. https://facades.lbl.gov/publications/model-based-controls-integrated
- *[LBNL-3906E]* Haves P, Hencey B, Borrelli F, Elliot J, Ma Y, Coffey B, Bengea S, Wetter M. 'Model Predictive Control of HVAC Systems: Implementation and Testing at the University of California, Merced', 2010.
- *[LBNL-1334E]* Stadler M, Marnay C, Siddiqui A, Lai J, Coffey B, Aki H. 'Effect of Heat and Electricity Storage and Reliability on Microgrid Viability: A Study of Commercial Buildings in California and New York States', 2009.
- *[LBNL-3067E]* Walker IS, Al-Beaini S, Borgeson S, Coffey B, Gregory D, Konis K, Scown C, Simjanovic J, Stanley J, Strogen B. 'Feasibility of Achieving Zero-Net-Energy Net-Zero-Cost Homes', 2009.
- *[CBE – Executive Summary]* Borgeson, S, Brager B, Coffey B, Haves P. 'Mixed Mode Simulations for Climate Feasibility', 2009. http://escholarship.org/uc/item/0hk689fx

OTHER

Teaching

Course Designer and Co-Lecturer, *UC Berkeley* Arch 298: Advanced Building Energy Simulation		2011

Professional and Volunteer Activities

Organizing Committee Member	*Intelligent Building Operations Workshop*, Boulder CO	2013
Workshop Organizer	IBPSA Canada-USA *Model Predictive Control in Buildings*	2011
National Board Member (USA)	International Building Performance Simulation Assoc. (IBPSA)	2008 - 2010
Convener, Interim Committee	IBPSA-USA San Francisco Chapter	2010
Graphic Design	*Intelligent Building Operations Workshop*	2013
	MPC in Buildings Workshop	2011
	SimBuild Conference	2008
Journal Referee	*J. of Building Performance Simulation, Building Research &Information*	
Conference Referee	*IEEE Conf. on Decision and Control, American Control Conf., SimBuild*	

Presentations of Note

Tutorial Session, *PyData NYC*: Using D3 in Jupyter	2015
Invited Seminar Presentation, *ASHRAE*: Application of Dynamic Optimization to Smart Building Systems	2014
Invited Presentation, 'Using Energy Simulation to Improve Building Performance: Combining BIM and Energy Monitoring', cbxchange.org 'Benefitting from BIM' event, London	2014
Invited Presentation, *Natural Resources Canada – Varennes, Controls Research Group*, to help develop their 3-year plan, presented a survey of the state of the art in MPC research for buildings	2011
Presentation to *IEA Working Group ECES Annex 20* (Energy Conservation through Energy Storage, Sustainable Cooling), representing *Public Works & Government Services Canada*, Japan	2005

INTERESTS

<u>Music</u>

Juilliard Evening Division (New York), Advanced Forum / Chopin Etudes classes	2012
San Francisco Conservatory, Adult Extension, lessons and performances	2010 - 2011
Royal Conservatory of Music, Toronto: Grade 9 Piano with Honours, Grade 3 History with Honours, Grade 3 Harmony with First Class Honours	1997

<u>Visual Arts</u>

The Art Students League of New York, Figure Drawing	2012
Building Local design-build workshop, Barichara, Columbia	2012
UC Berkeley Arch 200A: Graduate architecture studio course, part of PhD	2007
Emily Carr Institute of Art and Design, Continuing Studies: Basics of Architectural Design, Drawing for Architecture	2003, 2005
Ottawa School of Art: Perspective Drawing, Figure Drawing, Sculpture Casting, Intro to Painting	2003 - 2004

<u>Sport, Travel and Outdoor Adventure</u>

Five marathons (PB: 3:02), one triathlon, mountaineering and glacier travel, treks in the Himalaya	1998 - 2012
Solo bicycle voyage across Canada	2000
Canada World Youth's development program in Tunisia and Quebec	1999
High school varsity athlete: basketball, volleyball, track and field, badminton, golf	1997