Nicolas Fillion
Curriculum Vitae

✉ Simon Fraser University
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Contents

Areas of Specialization

Philosophy of Mathematics (Applied & Pure), Philosophy of Science, Logic & Formal Semantics, Scientific Computing

Areas of Competence

Decision and Game Theory, Early Analytic Philosophy, Philosophy of Physics, Epistemology, Ethics

Education

PhD	Philosophy, University of Western Ontario	2012
MSc	Applied Mathematics, University of Western Ontario	2011
BA	Mathematical Sciences, University of Illinois Springfield	2009
MA	Philosophy, Université Laval	2006
Certificate	Russian Studies, Université Laval and Russian State University for the Humanities	2006
BA	Philosophy, Université Laval	2003
DEC	Natural Sciences, Collège Mérici	2000

Professional Appointments

Assistant Professor	Simon Fraser University, Department of Philosophy	2015–current
Limited-Term Assistant Professor	Simon Fraser University, Department of Philosophy	2013–2015
Postdoc	The University of Western Ontario, Department of Statistics & Actuarial Sciences	2012–1013
Research Scholar	The University of Pittsburgh, Department of Philosophy	2011

Awards and Distinctions

1. Foundational Questions Institute (FQXi) 2015 Essay Prize "Trick or Truth: the Mysterious Connection Between Physics and Mathematics": 4^{th} prize out of more than 200 submissions from 46 countries for my essay "Demystifying the Applicability of Mathematics."
2. Notable Book 2013 list of the *ACM Computing Reviews* for the book *A Graduate Introduction to Numerical Methods* in the category "Mathematics of Computing."
3. University Teaching Honour Roll Certificate of Excellence 2011-2012, from the University of Western Ontario Students' Council.
4. Excellence Scholarship of Collège Mérici for the 4^{th} place in the 1998 competition in chemistry/biology.

Publications

Books

1. Fillion, N., Corless, R.M., and Kotsireas, I., Editors. (under contract). "Proceedings of the ACMES conferences," *Fields Institute Communications*, Springer.
2. Corless, R.M. and Fillion, N. (2013). *A Graduate Introduction to Numerical Methods, From the Viewpoint of Backward Error Analysis*, Springer: New York, 868 pp.
   Reviewed by: A. Townsend, *SIAM Review*, Vol. 58, Iss. 4, 2016; N. Higham, Blog entry, 2015; J.S.C. Prentice, *Mathematical Reviews*, January 2015; R. Plato, *zbMATH*, Vol. 1295, 2014.

Refereed Journal Articles

1. Fillion, N. (2018) "Clinical Equipoise and Ethics of Adaptive Clinical Trials," *Topoi*, Special issue: Foundations of Clinical Reasoning.
2. Fillion, N. and Bangu, S. (2015). "Numerical Methods, Complexity, and Epistemic Hierarchies," *Philosophy of Science*, 82: 941-955.
3. Bellhouse, D.R. and Fillion, N. (2015). "Le Her and Other Problems in Probability Discussed by Bernoulli, Montmort and Waldegrave," *Statistical Science*, 30(1): 26-39.
4. Fillion, N. and Corless, R.M (2014). "On the Epistemological Analysis of Modeling and Computational Error in the Mathematical Sciences," *Synthese*, 191: 1451-1467.

Refereed Book Chapters

1. Fillion N (2017). "Vindicating computer simulations in practice," in: J. Lenhard (Ed), *Mathematics as a Tool*, Boston Studies in the History and Philosophy of Science, Springer, pp. 137-156.
2. Fillion N (2016). "Demystifying the Applicability of Mathematics," in: A. Aguirre, B. Foster & Z. Merali (Eds), *Trick or Truth: the Mysterious Connection Between Physics and Mathematics?* (Essay-Winning Awards of the Foundational Questions Institute 2015), Springer, pp. 135-144.

Refereed Proceedings Article

1. Fillion, N. (2015). "The 18th-century origins of the concept of mixed-strategy equilibrium in game theory," in: M. Zack & E. Landry (Eds.), *Research in History and Philosophy of Mathematics*, Springer, pp. 63-78.
2. Fillion, N. (2008). "The Kolmogorov-Gödel Translation of Classical Arithmetic into Intuitionistic Arithmetic," in: A. Cupillari (Ed.), *Proceedings of the Canadian Society for History and Philosophy of Mathematics, Vancouver, June 2008*: pp. 77-88.

Commissioned Technical Report

Fillion, N. and Martelli, D. (2017). "Overview of Critical Thinking in the BC K-12 Curriculum Revisions: Implications for Post-Secondary Teaching and Learning," Commisionned by the Faculty of Arts and Social Science and the Faculty of Education at Simon Fraser University, 31 pp.

Encyclopedia Articles

1. Fillion N. (forthcoming), "Accuracy," in *Sage Encyclopedia of Theory*, J. Mattingly (Ed). Golson Publishing.
2. Fillion N. and Corless R.M. (forthcoming), "Perturbation Theory," in *Sage Encyclopedia of Theory*, J. Mattingly (Ed). Golson Publishing.

Critical Notices & Book Reviews

1. Fillion, N. and Ashton, Z. (2017) "Review of R. Wagner's *Making and Breaking Mathematical Sense*," *Canadian Mathematical Society Notes*, October/November, pp. 8-9.
2. Tardif, P.-A., Elawani, J., and Fillion, N. (2017). "François Tournier: un hommage," *Phares*, XVII: pp. 9-24.
3. Fillion, N. and Zurcher, B. (2014). "Review of Richard Arthur's *Natural Deduction: An Introduction to Logic with Real Arguments, a Little History, and Some Humour*," *Dialogue*, 54(1): pp. 190-192.
4. Kao, M., Fillion, N. and Bell, J.L. (2010). "Critical Study of Jean-Pierre Marquis: *From a Geometrical Point of View: A Study of the History and Philosophy of Category Theory*," *Philosophia Mathematica*, 18(2): pp. 227–234.

Pedagogical material & software

1. A fully integrated LaTeX package for dynamic and color-coded deductions and trees in classical and non-classical logic.
2. Fillion N. (2016). "Introduction to Logic Exercises: 694 supplemental exercises for *An Introduction to Logic* by R.T.W. Arthur", Broadview Press, distributed online with book purchase.

Papers under review

1. Fillion, N. and Moir, R. "Explanation and Abstraction from the Backward Error Analysis Perspective" (revise & resubmit, *European Journal for the Philosophy of Science*).
2. Corless, R.M. and Fillion, N. "Backward Error Analysis for Perturbation Methods" (book chapter under review).
3. Fillion, N. "Conceptual and computational mathematics."

Invited Colloquium Talks

1. "I can't get no satisfaction: the concepts we need to reconstruct arguments in applied math," Department of Logic and Philosophy of Science, University of California, Irvine, 2017.
2. "I can't get no satisfaction: the concepts we need to reconstruct arguments in applied math," Department of Applied Mathematics, Western University, 2017.
3. "The unreasonable effectiveness of mathematics from the numerical analysis point of view," Department of Mathematic, University of Saskatchewan, 2016.
4. "Demystifying the miracle of the effectiveness of applied mathematics," Department of Philosophy, University of Victoria, 2014.
5. "Backward Error Analysts Without Borders," Centre for Scientific Computing, Pacific Institute for the Mathematical Sciences (PIMS), Simon Fraser University, 2014.
6. "Aristotle's logic: A comparison of Łukasiewicz's and Corcoran-Smiley's reconstructions," Buffalo Logic Colloquim, The University at Buffalo, State University of New York, 2009.

Conference Activities

Invited Talks

1. Fillion, N. and Martelli, D."Overview of Critical Thinking in the BC K-12 Curriculum Revisions: Implications for Post-Secondary Teaching and Learning," Developing Minds: Critical Thinking in Curriculum Transfer, Faculty of Arts and Social Ssciences & Faculty of Education, Simon Fraser University, 2018.
2. "An approach to critical thinking: philosophy of all things!," British Columbia Social Studies Teachers Association Conference, Vancouver Tech, 2017.
3. "Conceptual and Computational Mathematics," Philosophy of Applied Mathematics Workshop, Paris-Sorbonne, 2016.
4. "The surprisingly old origins of modern decision and game theory," 43th Annual Philosophy of Science Conference, Inter-University Center, Dubrovnik, 2016.
5. "The Philosopher's Best Friend," Keynote address at the 2015 Western Canadian Undergraduate Conference, Vancouver, 2015.
6. "The Vindication of Computer Simulations," Mathematics as a Tool, Center for Interdisciplinary Studies, University of Bielefeld, 2014.
7. "Error and Computation in the Context of Scientific Modelling (with a Demystification of the Unreasonable Effectiveness of Mathematics)," 40th Annual Philosophy of Science Conference, Inter-University Center, Dubrovnik, 2013.

Contributed Talks

1. "Assessing inexactly computed solutions in modeling contexts," $4t^{th}$ International Conference on the History and Philosophy of Computing, Masaryk University, Brnó, Czech Republic, 2017.
2. "Conceptual and Computational Mathematics," Canadian Society for the History and Philosophy of Mathematics' annual meeting, York University, 2017.

3. "The Discovery and Justification of Mathematical Knowledge in the Light of Modern Computational Methods," Philosophy of Science Association's Biennial Meeting, Atlanta, 2016.
4. "Conceptual and Computational Mathematics," 53rd meeting of the Western Canadian Philosophical Association, University of Alberta, Edmonton, 2016.
5. "The surprisingly old origins of modern decision and game theory," Canadian Mathematical Society's winter meeting, Montreal, 2015.
6. "The surprisingly old origins of modern decision and game theory," Department of Philosophy, Simon Fraser University, 2015.
7. Fillion, N. & Zurcher, B., "Threshold Concepts in Formal Logic," Canadian Society for the History and Philosophy of Science's annual conference, University of Ottawa, 2015.
8. "Rethinking the relation between Verification and Validation," 2nd Algorithm and Complexity in Mathematics, Epistemology and Science conference, Western University, 2015.
9. Fillion, N. and Bangu, S., "Solutions in the Mathematical Sciences & Epistemic Hierarchies," Philosophy of Science Association's Biennial Meeting, Chicago, 2014.
10. "The Vindication of computer simulations," Knowledge and Models in Climate Science: Philosophical, Historical, and Scientific Perspectives, Rotman Institute of Philosophy, Western University, 2014.
11. Fillion, N. and Bangu, S., "Perspectives on Computation and Epistemic Hierarchies," 51rd meeting of the Western Canadian Philosophical Association, University of British Columbia, Vancouver, 2014.
12. Fillion, N., and Bellhouse, D.R., "Discovering the concept of minimax solution: Montmort, Waldegrave and Bernoulli," CSHPM, Brock University, 27/05/2014.
13. Zhao, K., Contreras, W., and Fillion, N., "Ultimatum Game as an Indicator for Altruism," Canadian Society for the History and Philosophy of Science's annual conference, Brock University, 2014.
14. Contreras, W., Zhao, K., and Fillion, N., "Asymptotic Reasoning in the Social Sciences," Canadian Society for the History and Philosophy of Science's annual conference, Brock University, 2014.
15. "Backward Error Analysis as a Model for Scientific Computation," Models and Simulations in the Sciences: Perspectives from Philosophy, History, and Policy, University of Notre Dame, 2014.
16. "Mathematical Models & Epistemic Hierarchies," 65th Annual Northwest Philosophy Conference, Pacific University, 2013.
17. "Minimal Models and Scientific Computation as Aspects of the Applicability of Mathematics," Workshop on the Applicability of Mathematics, Simon Fraser University, 2013.
18. "On the Epistemological Analysis of Modeling and Computational Error in the Mathematical Sciences," Canadian Society for the History and Philosophy of Science's annual conference, University of Victoria, 2013.
19. "The Applicability of Mathematics in the Natural Sciences," Department of Philosophy, Simon Fraser University, 2013.
20. "L'appliquabilité des Mathématiques en Sciences Naturelles," Faculty of Philosophy, Université Laval, 2012.
21. "Backward-Error Analysis Revisited," 30th Southern Ontario Numerical Analysis Day, University of Toronto, 2012.
22. "The Unreasonable Awesomeness of Mathematics," Philosophy Graduate Student Association's Colloquium Series, Western University, 2012.
23. Fillion, N., and Corless, R.M., "Computation and Explanation," The Plurality of Numerical Methods and their Philosophical Analysis, Institute for the History and Philosophy of Science and Technology, Université Paris-I Panthéon-Sorbonnes, 2011.
24. Fillion, N., and Moir, R., "Explanation and Abstraction: The Case of Backward Error Analysis," Philosophy of Science Association's Biennial Meeting, Montréal, 2010.
25. "Clinical Equipoise and the Ethics of Adaptive Trials," Meeting of the Canadian Society for the Study of Practical Ethics, Concordia University, 2010.
26. Fillion, N., and Moir, R., "Modeling and Explanation: Some Lessons from Modern Error Theory," Canadian Society for the History and Philosophy of Science's annual conference, Concordia University, 2010.
27. Fillion, N. and Moir, R., "A Step Forward with Backward Error," Philosophy Graduate Student Association's Colloquium Series, Western University, 2009.
28. "Two Traditions in Logic," Philosophy Graduate Student Association's Colloquium Series, University of Western Ontario, 2009.

29. "Conséquences observationnelles en mécanique des continua," 77$^{\text{ième}}$ Congrès de l'ACFAS, University of Ottawa, 2009.
30. "Logique aristotélicienne: Ontologie Formelle ou Épistémologie Formelle?," 77$^{\text{ième}}$ Congrès de l'ACFAS, University of Ottawa, 2009.
31. "Explanation in Phenomenological Theories of Physics," Philosophy Graduate Colloquium, University of Waterloo, 2008.
32. "The Kolmogorov-Gödel Translation of Classical Arithmetic into Intuitionistic Arithmetic," Canadian Society for the History and Philosophy of Mathematics' annual meeting, University of British Columbia, Vancouver, 2008.
33. "Aristotle's Logic and its Modern Reconstructions," Canadian Society for the History and Philosophy of Science's annual conference, University of British Columbia, Vancouver, 2008.
34. "The Semantics of Conditionals," 15$^{\text{th}}$ Philosophy Graduate Conference, University of Waterloo, 2008.
35. "Intuitionism and Logicism on the Foundations of Arithmetic," Philosophy Graduate Student Association's Colloquium Series, Western University, 2008.
36. "La distinction fregéenne sens/référence et les conditions de possibilité de la métathéorie," 75$^{\text{ième}}$ Congrès de l'ACFAS, Université du Québec à Trois-Rivières, 2007.
37. "Aristotelian and Modern Logic," 4$^{\text{th}}$ Annual Graduate Colloquium, Concordia University, 2007.
38. "L'axiomatique: Théorie Générale des Structures Conceptuelles," Colloque pour les étudiants gradués, Université Laval, 2006.

Breakout session leader
1. Critical Thinking Resource Symposium, BCSSTA & FASS, Simon Fraser University, 2018.

Poster presentation
1. Batterman, R.W., Fillion, N., Moir, R. and Overton, J., "Idealization in Scientific Explanation," Western Research Day, Western University, 2010.

Commentator
1. "Meaning, Type-Distinctions, and Predication" (by David Liebesman), Workshop: The Intellect and its Philosophical Limits, SFU, 2017.
2. "Poincaré and Structuralism in the Philosophy of Mathematics" (by Janet Folina), APA Pacific, Vancouver, 2015.
3. "Modality and the Progressive" (by Ivan Myerhofer), Philosophy of Language, Mind, and Cognitive Science, University of Western Ontario, 2007.

Teaching Experience

Simon Fraser University **2013–2015**

A. Graduate courses
   1. The Mathematics of Morality (with Evan Tiffany) S2017
   2. Model Theory F2016
   3. Philosophy as Analysis (with Martin Hahn) S2016
   4. Decision and Game Theory F2014
   5. Scientific Explanation S2014
   6. Asymptotic Explanation W2014

B. Upper-division undergraduate courses
   1. Deontic Logic W2018
   2. Advanced Modal Logic (with Ray Jennings) W2015
   3. Modal Logic F2014, F2015
   4. Philosophy of Science F2013, S2015

C. Lower-division undergraduate courses
   1. Critical Thinking S2014
   2. Introduction to Logic and Reasoning F2013, S2015, F2015, S2016, S2017, W2018
   3. Conspiracy Theories W2017

D. Individual teaching (see teaching portfolio for details)

The University of Western Ontario **2008–2012**

A. Lower-division undergraduate courses

1. Philosophy of Science W2012
2. Basic Logic (6-week intensive equivalent to a full-year course) S2010
3. Introduction to Philosophy (full-year course) F2008/W2009

Before that, I have been teaching assistant in 13 courses at the undergraduate and graduate levels, in philosophy, applied mathematics, and in French, at the University of Western Ontario, at the Russian State University for Humanities, and at Université Laval.

Guest Lectures

1. "A survey of scientific explanation," in the graduate course *A Survey of Philosophy of Science* (Kathleen Okruhlik), Department of Philosophy, UWO, February 2013.
2. "Computation in Scientific Explanation," in the course *Contemporary Philosophy of Science* (Andrew Wayne), Department of Philosophy, University of Guelph, 17 November 2010.
3. "L'œuvre de Frege et son Influence," in the course *Philosophie du Langage et Pragmatique* (François Pichette), Lettres et Communications, TÉLUQ, 3 November 2010.
4. "Basic Concepts of Game Theory," in the course *Decision Theory* (Brian Woodcock), Department of Philosophy, University of Western Ontario, 28 March 2006.
5. "Le Réalisme Épistémologique de Karl Popper," in the course *Introduction à l'Épistémologie des Sciences* (Daniel Descroches), Faculty of Philosophy, Université Laval, 19 March 2003.
6. "Induction, Vérification et Falsification," in the course *Histoire des Sciences* (Luc Tremblay), Département d'Histoire et Civilisations, Collège Mérici, 2 November 2002.

Outreach

Media appearances

1. "The Truth You Don't Know", *CPA magazine*, September 1, 2017.
2. "This semester, new courses run the gamut from gruesome to gleeful", *The Peak*, January 2017.
3. "SFU prof volunteers in Africa for Academics Without Borders," *The Peak*, March 17, 2016.
4. Radio-Canada (Première chaîne), Boulevard du Pacifique, 20 October 2015. Topic: The impact of the election of the Liberals for science and universities

Public Lectures

1. "Sizing your tin foil hat," Burnaby Festival of Learning, SFU, 2017.
2. "How to critically appraise conspiracy theories?", BC Humanist Association, Vancouver, 2017.
3. "Philosophy, Science, and the Quest for Knowledge," Lecture for the Student Service Recruitment Program, SFU, 2015.
4. "Axioms," *Mathematics After Hours* outreach program, Department of Mathematics, SFU, 2015.
5. "A taste of infinity," *A taste of* π high school outreach program, Department of Mathematics , 2014.

Related Professional Activities

Technical Workshops

1. "Introduction to LaTeX, Bibtex, Beamer, Tikz, and all that", Workshop for faculty members and graduate students, Department of Mathematics, SFU, November 2015.
2. "Introduction to LaTeX", Workshop for faculty members and graduate students, Department of Philosophy, SFU, 11 September 2014.
3. "Introduction to Matlab", Workshop for faculty members and graduate students, Department of Philosophy, SFU, 22 October 2013.
4. "Introduction to LaTeX", Workshop for faculty members and graduate students, Department of Philosophy, UWO, 26 March 2012.
5. (With A. Botterell) "Academic websites," Workshops for Graduate Students in Philosophy 2008-2009, Department of Philosophy, The University of Western Ontario, January 2009.

6. "Typesetting in LaTeX" Two-session workshop for faculty members and graduate students, Department of Philosophy, The University of Western Ontario. September 2007, February 2010, Winter 2013, Summer 2013.

Reading Groups with Graduate Students

1. Applied modal logic W2017
2. Philosophy of science (Realism/Anti-realism) S2014
3. Philosophy of science (Modelling) F2013

Languages

French (Native)
English (Fluent)
Russian (Reading skills)

Professional Affiliations

Center for Scientific Computing, Simon Fraser University 2014–Present
Computer Algebra Research Group of Wilfred Laurier University 2016–Present
Rotman Institute of Philosophy, University of Western Ontario 2007–2013

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