

# Curriculum Vitæ

Ioan Muntean, PhD

## QUALIFICATIONS

### Areas of Specialization (AOS)

- Philosophy of science, especially philosophy of physics and mechanistic philosophy
- Philosophy of technology, primarily philosophical issues related to computing
- Epistemology and ethics of computation, especially A.I., evolutionary computation, and connectionism
- Applied ethics, especially machine ethics, and ethics of technology and science

### Areas of Competence (AOC)

- Philosophy of mind
- Cognitive science
- Bioethics
- Logic and critical thinking
- Ethics and applied ethics
- Metaphysics

## GRADUATE EDUCATION

- PhD: University of California, San Diego - Department of Philosophy
- M.A: University of Bucharest - Department of Philosophy

## UNDERGRADUATE EDUCATION

- B.A. in Philosophy: University of Bucharest - Department of Philosophy
- B.S. in Applied Physics: Polytechnic Institute of Bucharest - Electrical Engineering and Communication

## SELECTED PUBLICATIONS

- (2025) *Moral coherentism in the age of Artificial Intelligence. A pattern-based project in machine moral learning*. American Philosophical Quarterly, vol 62, issue 3, 279-308.
- (2024). *Mechanisms “all the way down”?* Review article of *Mechanisms in Physics and Beyond*. Philosophical Problems in Science, vol 74, issue 1, pp. 302-316.
- (2021) *Toward a Rational and Ethical Sociotechnical System of Autonomous Vehicles: A Novel Application of Multi-Criteria Decision Analysis*. PLOS ONE 16 (8). A multi-author paper coordinated by Veljko Dubljevic and William A. Bauer.
- (2020) *A Metacognitive Approach to Trust: Agency, Confidence, and Autonomy. A Case Study of Trust in Artificial Autonomous Agents (AAA)*. In D. Wittkower (ed.), *Computer Ethics - Philosophical Enquiry (CEPE) Proceedings*. Digital Commons, Old Dominion University.
- (2017) *Artificial moral cognition: from functionalism to autonomous moral agents*. Co-authored with Don Howard. 1. Refereed Publications. In Powers, Thomas M. (ed.), *Philosophy and Computing: Essays in epistemology, philosophy of mind, logic, and ethics*. Springer, Ch 8.

- (2016) *A minimalist model of the artificial autonomous moral agent (AAMA)*. Co-authored with Don Howard. In *SSS-16 Symposium Technical Reports*. Association for the Advancement of Artificial Intelligence, Palo Alto, CA.
- (2015) *Metaphysics from String Theory: S-Dualities, Fundamentality, Modality and Pluralism*. In Tomasz Bigaj, Christian Wüthrich (eds.), *Metaphysics in Contemporary Physics*. Series: Poznan Studies in the Philosophy of the Sciences and the Humanities. Rodopi/Brill, Amsterdam/New York, 259-292.
- (2015) *Structural Pluralism and S-Dualities: A Project in String Realism*. In Pârnu, Ilie and Sandu, Gabriel and Toader, Iulian D., *Romanian Studies in Philosophy of Science*. Series: Boston Studies in the Philosophy and History of Science. ISBN 978-3-319-16654-4
- (2014) *Computation and Scientific Discovery? A Bio-Inspired Approach*. In Sayama, Hiroki and Reiffel, John and Risi, Sebastian and Doursat, Rene and Lipson, Hod (eds.), *Artificial Life 14. Proceedings of the Fourteenth International Conference on the Synthesis and Simulation of Living Systems*. Series: Computer Science and Intelligent Systems. ISBN 9780262326216
- (2014) *Artificial moral agents: creative, autonomous, social. An approach based on evolutionary computation* (co-author: Don Howard). In Johanna Seibt, Raul Hakli, Marco Nørskov *Sociable Robots and the Future of Social Relations. Proceedings of RoboPhilosophy 2014*. Series: Frontiers in Artificial Intelligence and Applications. IOS Press, Amsterdam, Berlin, Tokyo, Washington DC, 217-231.
- (2011) *The Fiber Bundle at the Gates of Metaphysics. Challenging Tim Maudlin's Proposal*. In Okasha, Samir; Hartmann, Stephan; De Regt, Henk W., *EPSA Philosophy of Science: Amsterdam 2009*. Series: The European Philosophy of Science Association Proceedings. Springer, Berlin. New York.
- (2008) *Mechanisms of Unification in Kaluza-Klein theory*. In Dennis Dieks, *The Ontology of Spacetime, II*. Series: Philosophy and Foundations of Physics. Elsevier, Amsterdam, 275-300.
- (2007) *Autonomous Agency, A.I., and Allostasis: A Biomimetic Perspective*. Co-authored with Cory Wright. *Pragmatics and Cognition*. Special Issue: *Mechanicism and autonomy: what can robotics teach us about human cognition and action?* 15 485-513.
- (2007) *Leibniz and the Mathematization of Forces*. *Revue Roumaine de Philosophie* 51 100-120.
- (2005) *Philosophy of Science: Laws*. Co-authored with Anna Alexandrova; Nancy Cartwright; Sophia Efstathiou; and Andrew Hamilton. In Frank Jackson and Michael Smith, *The Oxford Handbook of Contemporary Analytic Philosophy*. Oxford University Press, Oxford, 792-818.
- (2004) *The Primal Miracle and the Existence as Totality in Leibniz*. In *Arches, Revue Internationale des Sciences Humaines* 7 53-61.

## ACADEMIC EMPLOYMENT

### University of Texas, Rio Grande Valley

2025-present Lecturer in Bioethics, Department of Philosophy

2020- 2025 Lecturer, Department of Philosophy

### University of Illinois, Urbana-Champaign

2022-2024 Lecturer, Department of Philosophy

### Western Carolina University

2018-2019 Philosophy and Religion Department

### University of North Carolina, Asheville

2016-2020 Master of Liberal Arts and Sciences Program (MLAS)

2017-2018 Honors Program

2017 Department of Philosophy

2014-2017 Humanities Program

2015-2019 Faculty Research Fellow

### University of Notre Dame

2013-2016 Visiting scholar at the Reilly Center for Science, Technology, and Values

## **Butler University**

2010, 2014 Department of Philosophy and Religious Studies, Lecturer

## **Indiana University**

2010-2014 Indiana University system (Fort Wayne, Kokomo, Richmond)

## **University of Leeds, United Kingdom**

2009-2010 Department of Philosophy and History and Philosophy of Science, Lecturer

## **University of California, San Diego**

2003-2009 Department of Philosophy, graduate instructor

2009 Department of Philosophy, lecturer

## **University of Bucharest, Romania**

1999 – 2007 Department of Philosophy, associate professor (tenured)

## **Polytechnic University of Bucharest**

1995 – 1996 Department of Social Sciences, assistant professor (tenured)

## **SELECTED REFEREED PRESENTATIONS<sup>1</sup>**

- January 2025: *The problem-solving and risk-taking components of creativity in science*. Meeting of the Eastern APA Division, New York.
- November 2024: *Function, constraints, and aggregation of mechanisms: a functional perspective*. The 29<sup>th</sup> Biennial meeting of the Philosophy of Science Association, New Orleans.
- July 2024: *Creativity in science, epistemic environments, and epistemic risk*. XXV World Congress of Philosophy, Rome.
- May 2024: *Distributive creativity, epistemic environments, and scientific progress*. Society for the Philosophy of Science in Practice (SPSP), Columbia, SC.
- July 2023: *Algorithmic explanations in machine learning: in search of (some) explananda*, CLMPST-2023, 17th International Congress on Logic, Methodology and Philosophy of Science and Technology, Buenos Aires, Argentina.
- April 2023: *Autonomy and intelligence of artificial agents: modeling, experimentation, and simulation in A.I.* The Pacific APA Division Meeting. San Francisco.
- March 2023: *A functional and interventionist approach to scientific progress: computational science at work*. &HPS9, The 9th Conference of the Integrated History and Philosophy of Science. The University of South Carolina.
- July 2022: *Algorithmic explanations in machine learning: in search for explananda*. The International Association for Computing and Philosophy (IACAP), Santa Clara University.
- April 2022: *Explanation without representation in computational models*. The meeting of the APA Pacific Division, Vancouver, British Columbia, Canada.
- February 2022: *Functionalism, Perspectivism, and Model Pluralism*. The APA Central Division meeting, Chicago.
- January 2022: *Functionalism about scientific perspectivism*. The APA Eastern Division meeting (delivered online).
- September 2021: *Autonomy and intelligence of artificial agents: between experimentation and simulation*. PSX6 (Philosophy of Scientific Experimentation), delivered online.
- July 2021: *A Bayesian approach to trust: metacognition, confidence, autonomy*, CEPE-IACAP join conference, delivered online.
- November 2021: *Models and experiments in A.I. research: exploring autonomy and intelligence*. Online poster session at the 27th Biennial Meeting of the Philosophy of Science Association, Baltimore (PSA2020/2021).
- November 2020: *Science and Humanism between Accuracy and Confidence: A Plea for a Metacognitive Approach to Trust in Science*. Science and Humanism workshop, delivered online.
- August 2020: *A probabilistic-functional approach to perspectivism and a case study*. ECAP10 (European Congress of Analytic Philosophy), Utrecht U., delivered online.

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<sup>1</sup> A full updated list can be found at: <https://imuntean.net>

- May 2019: *A.I.: risk, fallibilism, and trust. A Bayesian approach*. Computer Ethics—Philosophical Enquiry (CEPE) & INSEIT (International Society for Ethics and Information Technology), Old Dominion U., Virginia.
- May 2018: *A multi-objective approach to artificial intelligence and artificial morality: a case for machine learning decision*, Brain-based and Artificial Intelligence, Illinois Institute for Technology, Chicago.
- May 2018: *Fictions, maps, and structures in forecast models*, 46th Annual Meeting of the Society for Exact Philosophy, U. of Connecticut, Storrs.
- March 2018: *Aggregating multilevel mechanistic models from Big Data with Machine Learning*, Models and Simulations 8, U. of South Carolina.
- October 2017: *Bettering the Best System with Big Data*, Metaphysics and the Laws of Nature, U. of Colorado, Boulder.
- June 2017: *The small from the Big: discovering models and mechanisms with machine learning*, International Association for Computing and Philosophy (IACAP), Stanford.
- May 2017: *'Unconceived alternatives' or 'expected unifications'? An eliminative argument against Stanford's New Induction*, 45th meeting of the Society for Exact Philosophy (SEP), U. of Calgary.
- November 2016: *Artificial moral agency: learning, autonomy and creativity*, Humanities and Technology Association (HTA), Salve Regina U.
- June 2016: *Generalized Moral Agency: Artificial Moral Functionalism and Moral Behaviorism*. IACAP 2016, U. of Ferrara, Italy.
- June 2016: *Fictions, the Future, and Maps in Forecast Models*. Models and Simulations (MS7), U. of Barcelona, Spain.
- May 2016: *Structure realism meets pluralism*. 44th meeting of the Society for Exact Philosophy (SEP), U. of Miami, FL.
- March 2016: *The artificial autonomous moral agent (AAMA): a minimalist model*. Co-authored with Don Howard. Symposium within AAAI. Ethical and Moral Considerations in Nonhuman Agents, Stanford.
- February 2016: *Strong-weak dualities and scientific realism: history and present cases*. 'The History of Science and Contemporary Scientific Realism' conference, Indiana U.—Purdue U. Indianapolis.
- March 2015: *AdS/CFT duality beyond emergence of spacetime: A case for unification*. Beyond Spacetime II, U. of California, San Diego.
- February 2015: *Virtue in Machine Ethics: An Approach Based on Evolutionary Computation*. Co-presenter: Don Howard. APA Central, 2015, St. Louis, MO.
- November 2014: *Genetic algorithms in scientific discovery: a new epistemology?* Philosophy of Science Association Meeting (PSA2014), Chicago.
- October 2014: *Plurality of Models, Optimization and Mechanisms in Climate Studies. The Role of Feedback in the New IPCC Report*. Knowledge and Models in Climate Science, Rotman-Institute, U. of Western Ontario.
- July 2013: *The Digital Guesswork: a Philosophical Appraisal of Genetic Algorithms and their Epistemology*. The International Association for Computing and Philosophy (IACAP), U. of Maryland, College Park.
- May 2013: *Principles, Constraints, and Equivalence in String Theory*. Bucharest Colloquium in Analytic Philosophy. New Directions in the Philosophy of Physics (BCAP 2013), Bucharest.
- February 2013: *'Model-building', Identity, Individuation, and Individuality in Cognitive Neurosciences*. The American Philosophical Association, Central Division (APA-Central), New Orleans.
- October 2012: *Different is better: possibility in metaphysics and science*. Society for Exact Philosophy, (SEP-2012). Ohio State U.
- September 2012: *Structures, dualities and emergence: the case of string theory*. Structuralism in Physics and Mathematics. International Closing Conference, U. of Bristol.
- October 2011: *Metaphysical Possibility and Scientific Practice*. Indiana Philosophical Association, Hanover College.
- April 2011: *Genetic numerical simulation and the 'upward epistemology'*. Indiana Philosophical Association, Ball State U.
- November 2010: *String theory: explanation and foundationalism*. Philosophy of Science Association Biennial Meeting, (PSA-2010), Montreal.
- July 2010: *A structural guide to string theory*. Structure and Identity, U. of Bristol.

- July 2010: *Digital guesswork: discovery and genetic algorithms*. Joint Session of the Aristotelian Society and the Mind Association, (Aristotelian/Mind-2010), U. College Dublin.
- July 2010: *Two types of explanation in string theory*. Annual Meeting of the British Society for the Philosophy of Science, (BSPS-2010), U. College Dublin.
- July 2010: *Can a quantum theory explain spacetime? The String Theory case*. Royal Institute of Philosophy: the 16th U.K. and European meeting on the Foundations of Physics, U. of Aberdeen.
- October 2009: *Fiber Bundles: Interpretation and Formalism*. The European Philosophy of Science Association (EPSA-II), U. of Amsterdam.
- May 2009: *A Nascent Work on Universals: T. Maudlin's Fiber Bundle Metaphysics*. Society for Exact Philosophy (SEP), U. of Edmonton.
- March 2009: *Simulation and Stability of Theories*. Models and Simulations (MS3), U. of Virginia.
- July 2008: *Allostasis and homeostasis in life sciences and in robotics. Philosophical implications*. The 2008 North American Conference on Computing and Philosophy, Indiana U.
- April 2008: *Dynamics and Emergence in the Definition of Living Systems*. 7th Annual Conference in Philosophy and Biology, Duke U., North Carolina.
- June 2006: *Unification and Explanation in Kaluza-Klein Theory*. Second International Conference on the Ontology of Spacetime, Concordia U., Canada.

## SELECTED INVITED OR IN-HOUSE PRESENTATIONS<sup>2</sup>

- September 2024: *Facts-values, apriorism, coherentism, naturalism. Reassessing some philosophical dichotomies in the age of AI*. The UTRGV Philosophy Research Forum.
- July 2024: *Algorithms, models, intelligence: explainability and explanation in AI*. Department of Theoretical Philosophy and CELFIS, University of Bucharest, Romania.
- March 2022: *What can we learn (or unlearn) from Artificial Intelligence? Notes on epistemic uncertainty and epistemic opacity*, UTRGV Philosophy Club.
- April 2018: *Reasoning with constraints and enablers in science. The case of principles in physics*, Philosophy of Science in Appalachia workshop, U. of Kentucky.
- June 2015: *The "action-based, principle-centric" Autonomous Moral Agent, and its alternatives: projects in Machine Ethics*. Symposium organizer, panelist, and co-presenter with Don Howard. IACAP-CEPE 2015, U. of Delaware.
- April 2015: *'Soft computing' and Virtue Ethics: the philosophical challenges of building an Autonomous Moral Agent*. Virginia Tech Philosophy Colloquium Series.
- March 2011: *Informational Session: String Theory for Philosophers*. The American Philosophical Association, Central Division, APA-2011, Central. Minneapolis.
- July 2009: *Allostasis and its Importance for Neurodynamics*, Society for Autonomous Neurodynamics, (SAND-VI). Salk Institute, San Diego.
- March 2007: *Unified Field Theories*. Co-presented with Tilman Sauer, CalTech. Southern California Philosophy of Physics Reading Group, U. of California, Irvine.

## FELLOWSHIPS, HONORS, AND AWARDS

- Teaching Relief Scheme. Issued by The School of Philosophy, University of Leeds.
- Humanities Fellowship. Issued by the Center for the Humanities, UCSD.
- Research Grant (directed by Craig Callender). Issued by the Academic Senate of the University of California.
- Research Fellowship at Syracuse University, NY, and at the CUNY, NYC. Issued by the Research Fund of the University of Bucharest and The Romanian Research Council.
- Research Fellowship at the University of Leeds and the University of Oxford. Issued by the Office of Study Abroad Scholarships of Romania.

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<sup>2</sup> A full updated list can be found at: <https://imuntean.net>

- “Science and Rationality”, Doctoral Support Program (coordinators: W. Newton-Smith and M. Notturmo). Issued by the Central European University.

## PROFESSIONAL MEMBERSHIP

- Philosophy of Science Association (PSA); American Philosophical Association (APA); European Philosophy of Science Association; British Society for the Philosophy of Science.

## PROFESSIONAL SERVICES

### Referee or reviewer for professional journals

- Journal for General Philosophy of Science, Philosophy and Information; American Philosophical Quarterly; Philosophy of Science; Australasian Journal of Philosophy; Ethics of Information and Technology; The British Journal for the Philosophy of Science; Studies in History and Philosophy of Modern Physics; International Studies in the Philosophy of Science

### Referee or reviewer for publishing houses

- Springer, US; The Continuum Publisher House; Wadsworth, USA; *Elsevier* Publishing House; *Humanitas* Publishing Consortium, Bucharest (referee and translator); *Teora* Publishing House, Bucharest; All Publishing House, Bucharest (referee and translator)

### Community engagement

Co-organizer:

- Meeting of the *Mid-South Philosophy of Science Network* (U. of Kentucky 2019);
- Commentator at meetings of the APA, PSA, BPSA;
- Commentator at various workshops: *BSPS*, *Digital Worlds* (UTRGV), *APA*
- Organizer of PhiloSTEM (Philosophy of Science, Technology, Engineering and Mathematics), a workshop series organized by the University of Indiana (2010-2014). co-organized with B. Bundt (IPFW) and D. McCarty (I.U.);
- Public engagement: talks and interviews at the *Pints with Professors* (Archetype Brewing, Asheville); several interviews and panels on BBC and Radio Romania (2000-2017); three talks at the Brown-bag series at UNCA (2015-2020).

### Administrative Services

- Faculty advisor of the student-led group PHIL+STAIRS (Philosophy and the South Texas Artificial Intelligence Research Society)
- Judge and vice-coach of the Ethics Bowl Team at UT Rio Grande Valley, training for participation at the 2025 APPE IEB National Championship;
- Application reviewer for the Undergraduate Admission Office, University of Illinois, Urbana-Champaign;
- Member of the Admission Board, U. of Bucharest;
- Member of the Admission Board, the Polytechnic University, Bucharest;
- Member of the high-school recruitment committee at the University of Leeds, UK;
- Web development committee at the University of Illinois, Urbana Champaign;
- Mentor in the program Students as Scholars, U. of Leeds;
- Dissertation advisor (6 theses), U. of Leeds;
- Webmaster, I.T. manager, and creator of ARISTOS, a Web-based educational resource of the Department of Philosophy, University of Bucharest;

### Certificates

**Quality Matters:** Independent Applying the Q.M. Rubric (APPQMR). <https://www.qualitymatters.org/>

### Language skills

Write and Speak:	French, Romanian;
Read	German, Italian, and Spanish;
Ancient languages	Greek (4 years of study); Latin (2 years of study)

## Personal information

Citizenship                      U.S. and Romanian

## REFERENCES

William Bechtel (U.C. San Diego),  
Bernd Buldt (PFW U.),  
Craig Callender (U.C. San Diego),  
Nancy Cartwright (Durham),  
Steven French (U. Leeds),  
Gregory Gilson (U. of Texas),  
Don Howard (Notre Dame),  
Robin Kar (U. of Illinois),  
Chris Smeenk (Western U.),  
Christian Wüthrich (U. of Geneva)

Updated: 29 March 2025