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Contents

Guest Editorial

Dear Reasoners,

I am happy to have the chance to introduce you to Jacopo Tagliabue, a logician and philosopher by training, now converted to A.I. Scientist at COVEO in NYC. This is the second interview in a row about Academics run amok and turning to Industry, after last month's interview with Jeffrey Helzner. But we are not pushing you uncritically towards the lures and advantages of a life outside of Academia. Rather, we are interested in considering the opportunities that young PhDs (yes, even in Philosophy) have when completing their first period of intense research.

I met Jacopo in 2013 at the Fifth Workshop on the Philosophy of Information, where our respective talks brought us soon to some common research project on simulation of trust and distrust relations, with applications to vehicular ad hoc networks and swarm robotics. Today our paths and research interests intersect in several ways, and we take every chance to update each other on current projects, looking for the next problem to tackle together, usually over pizza and beer. Always keep your mind open and look for interesting things to do, wherever they may come from. Thanks to Jacopo for offering his views on Academia, Industry and Science, I personally hope our readers will find something to consider.

Giuseppe Primiero
University of Milan

Features

Interview with Jacopo Tagliabue

Giuseppe Primiero: Tell us about your background, where you grew up and your early studies.

Jacopo Tagliabue: I grew up between Como and Milan, in Italy. I have a life-long interest in languages: my final essay in high school was on Gödel's theorem (I decided after reading Hofstadter's book) and so picking up logic at Università San Raffaele in Milan, was a natural choice. My undergrad was mostly focused on logic, philosophy of cognitive sciences and ontology.

GP: After which you went on to do a PhD. Yours was an interdisciplinary experience, I think.

JT: Yes, I would say more piecemeal than "interdisciplinary" by design! Before my PhD I started studying other topics that just picked my interest – I took microeconomics and statistics classes first, and then had the luck of spending a summer at the Santa Fe Institute studying complexity. I already knew some

programming and that summer gave me a good chance of practicing NetLogo and agent-based models. My PhD dissertation was a strange interplay between philosophical logic, formal ontology and automated reasoning, using cellular automata as a conceptual playground: as part of my PhD, I spent some time at MIT in the computer science department and that helped me further broadening my horizons.

GP: So since early on you where working at the intersection of Philosophy and Computing, what was the triggering factor?

JT: Philosophy and computing have logic as a common "latent factor" (as my machine learning soul would put it). As I mentioned, my interest in philosophy was mostly related to logic in the first place: from there to computability theory it is a pretty straightforward path. On a more "cognitive" side of computing, philosophy of mind and A.I. are also intimately related: you can't really understand one without the other.

GP: How much Logic and Formal studies where part of your training?

JT: I took classes in both qualitative (logic, computability etc.) and quantitative reasoning (statistics, econometrics, etc.): I never took classes in programming, and that may explain why my code is still so bad after all these years. I liked logic per se initially, but it turns out I am better at using it to model structures than to prove some exoteric property of modal system XYZ. In retrospect, I see the first part of my intellectual journey as being fundamentally about deep and static structures; and the second one (in which I still am now) as being about learning, and how we can build and leverage structures in a noisy and uncertain world.

GP: And then at some point you moved to Industry. Tell us about that choice, what was difficult, and which skills from your studies helped you transitioning.

JT: I picked up programming early on (before my PhD) and started working as an IT consultant (very unsexy name for what now would be "data scientist") in a small company with a substantial R&D component: it was before the A.I. hype we live today, and it was a very gradual change that turned out to be a fulfilling experience. By the end of my PhD, I accumulated the above mentioned random variety of interests and studies: I knew I liked to be "less disciplined" and more serendipitous that most people in academia, and I thought it was easier to live with the compromises I have to make in industry – so the choice was made. When starting working full-time in industry, I think that the ability to clearly articulate thoughts (in Italian and English), read and evaluate arguments and, more than anything, the ability to independently learn new topics without supervision (through books and the Internet) were invaluable skills to have.

Of course, nothing is perfect (not to be philosophical here!). For me the hardest thing was – and still is – that curiosity is (even in the best case) only part of a project: very few companies can pursue crazy ideas for the sake of knowledge, so there are times in which I would like to investigate X more or explore Y in depth, but the opportunity cost (or the marginal value) for the business is not ideal. I still publish here and there, but it's more of a hobby and "giving back" to the community than a real research agenda to pursue.

GP: What else did you have to learn from scratch?

JT: Oh, countless things! As of now, I have been through many lives in industry, from "IT consultant" to "data scientist", from "entrepreneur" back to "A.I. scientist": each of the steps along this adventurous road forced me to quickly learn skills and tricks. If I had to pick three of my "least favorite things" I had to learn something about, I would pick accounting, immigration law and fundraising.

GP: Is Industry more or less demanding than Academia, would you say?

JT: Generally, it's a different kind of pressure: failing to deliver in industry may mean an awful outcome for a lot of people, while missing a deadline for submitting an important paper is usually bad (possibly very bad) "just" for you. On the job market side though, industry (well, my industry) is generally more forgiving: there are plenty of good, interesting jobs in many cities, so it's much easier to find a good work-life balance when compared to academia, which I feel often puts unreasonable constraints on the lives of researchers.

GP: And more or less fun?

JT: I generally strive to never take anything seriously, so both academia and industry have been a constant source of fun throughout these years (not to mention, a vast part of my friends are still full-time academics). My fondest memories from academia are probably from the short-but-intense time I spent in Boston, while the funniest moments in my industry life are from my startup days.

GP: Tell us a bit about your current work: what are the hot topics in the area? Any trace of it from your PhD?

JT: I am currently the lead A.I. scientist at Coveo, working mostly on topics in Natural Language Processing (NLP) and machine learning. NLP is having a big "hype" moment thanks to some very recent advancements in deep neural networks, but I'm personally a bit skeptical of the current "gold rush" to improve by another 0.1% the accuracy of our models on a dataset X. Unfortunately, symbolic reasoning is not exactly popular these days (that said, check this paper from Deepmind!), but I firmly believe that the next big thing in A.I. will inevitably come from mixing symbolic and neural approaches.

GP: Are there moments where you think coming from Academia is a disadvantage?

JT: In my field (A.I., data science, etc.) coming from an advanced degree is generally perceived as a strong plus and it can be used to stand out in a rich but crowded job market – obviously, an advanced degree is useful insofar as the research was in a related field, and the candidate has some quantitative and coding skills.

GP: Would you advise for or against such a move?

JT: It really depends on personal goals, opportunities, things you like (for example, some strongly dislike teaching, some love it) etc.. An extraordinary scholar has probably a very fulfilling life, but an average scholar, or even a pretty good one, may find themselves in a city, country, institution that may not be ideal from many perspectives. On the other side, a good but not stellar A.I. scientist will have a mix of interesting and less interesting challenges in their daily job, but they can command higher-than-average salary and enjoy the freedom of a global booming market. Finally, if you like working with data (of many kinds), it is usually easier to get ahold of interesting datasets working for high-tech companies, especially in the

United States.

GP: Finally, tell us about the next steps. Any exciting research topics you want to explore next? And how to apply them?

JT: After all these years, surprisingly most of my theoretical and practical interests still revolve around language!

There are two big challenges in NLP that I would like to tackle: first, trying to reconcile the notion of meaning we have from statistics with the one from model-theoretic semantics (I also wrote something non-technical on this in the past); second, study "learning to learn" in the context of language.

In particular, since linguistic data are very sparse (i.e. most words and expressions are incredibly rare, but still correct and useful nonetheless), I don't think any corpus will ever be enough to cover what we need in practical applications: I think we need to accept that our systems will be "imperfect" by design at first, and that the majority of our scientific and engineering effort should be directed in how to handle cases of unknown concepts/uncertainty (that is, algorithms behind the scenes, but also the general human-machine interaction) – it's ok to not know at first, the difference is how to close the gap effectively asking for human help.

GP: Thanks so much Jacopo!

News

Calls for Papers

Idealization, Representation, Explanation Across the Sciences: special issue of *Studies in History and Philosophy of Science Part A*, deadline 15 January.

Truth and Falsity: special issue of *Kairos*, deadline 28 February.

What's Hot in ...

Medieval Reasoning

Medieval philosophy is neither a small nor an idle field. And how could it be, covering a period of roughly a thousand years and at least four different linguistic traditions (i.e. Latin, Arabic, Hebrew and Byzantine Greek), and that is if we want to limit ourselves only to the West and the Middle East? Keeping up with what is going on in the field is hard even for an expert – let alone for anyone who might want to casually poke their nose around, maybe prompted by one of these columns. Hence, this month, I would like to use this space to recommend some online resource of Medieval Philosophy that could be useful for both beginners and experts alike. The following annotated list is not intended to be exhaustive and is limited to electronic resources such as online databases, digital archives, collective blogs and shared social platforms where to find texts and/or updates on major publications and academic events. Webpages focused on individual authors or specialised projects have been intentionally omitted.

The webpage of the *Société Internationale pour l'Étude de la Philosophie Médiévale* (SIEPM) (https://hiw.kuleuven.be/siepm/index.html) collects information on conferences and publication updates in the general field of Medieval Philosophy. The site has also a page of links to other similar online resources, to digital archives and to the SIEPM's *Medieval Philosophy Online Digital Resources* (http://capricorn.bc.edu/siepm/) website. This archive lists available electronic resources (online catalogs, bio-bibliographical databases, etc.) and has the ambitious goal of completeness. It also includes a rich and freely accessible "virtual library" where digitised books are available. If you are looking for a medieval philosophical text (especially if it's in Latin), this is where to start.

Although you might need some basic German to navigate ALCUIN (https://www-app.uni-regensburg.de/Fakultaeten/PKGG/Philosophie/Gesch_Phil/alcuin/index.php), this enormous database is extremely useful for retrieving biographical data on almost 7000 medieval authors and, above all, textual data on the sources, reception, transmission, and remarkable peculiarities of almost 34.000 medieval philosophical texts. It is huge and mildly addictive – but the quality of my life has improved greatly for knowing who Transmundus is, which is absolutely worth having to cope with the compulsion of a daily random search.

Managed by Bob Pasnau, *In Medias Phil* (https://inmediasphil.wordpress.com/) is a blog for sharing and collecting relevant information of general interest for the Medieval Philosophy academic community, with a distinct, deliberate and pleasantly pragmatic lack of "rants and philosophical musings" (as per *About*).

While neither as extensive nor as regularly updated as the pages listed above, on the website of the *Society for Medieval Logic and Metaphysics* (https://faculty.fordham.edu/klima/SMLM.htm) you can find some freely accessible secondary literature – i.e. most of the proceedings of their previous meetings.

Pariscope médiéval (https://parimed.hypotheses.org/) is the platform for French Medieval Philosophy. The aim of this scientific blog is to share all news (publications, workshops, seminars, calls for applications, etc.) in the field of Medieval Philosophy in France. The Pariscope also offers a selection of links to digitised texts that is quite useful.

Alas, the British counterpart to the *Pariscope médiéval* (http://www.medievalphilosophy.org.uk/) pales in comparison, but it is at least useful to keep up with the programmes of the *Medieval Philosophy Network* meetings, so – if you are on this side of the Channel – it might be worth taking a look anyway.

If Medieval Logic is your cup of tea, the following places are for you: the *Medieval Logic* Facebook Group (https://www.facebook.com/groups/medievallogic/?hc_location=ufi); *Medieval Logic Semantics* on Wordpress (https://medievallogic.wordpress.com/); and, last but not least, the *Logic Museum*(http://www.logicmuseum.com/), which is actually a website about the history of logic tout court but offers a rich selection of medieval logical texts, translations and studies.

Finally, while not being strictly medieval,*History of Philosophy without Any Gaps*(https://historyofphilosophy.net/) must have a reference. The podcast lectures and expert conversations on the history of philosophical traditions (without any chronological or geographical gaps!) are accessible,

brilliant and engaging – as is also the associated blog.

Graziana Ciola
Durham University

Uncertain Reasoning

It seems to me that science provides interesting kinds of inference that we uncertain reasoners should study. I don't mean the evidence that pyschologists and behavioural economists produce regarding the inference behaviour of normal people, I mean the inferences that scientists themselves make. Scientists are often remarkably successful (in terms of accurate prediction, new technologies and so on) in the inferences they make, and it seems natural to regard science as a paradigm case of rational inference. If we accept this, we are then in the awkward position of having a prima facie need to rationalise some of the odd inferential behaviour scientists engage in.

Take "inference to the best explanation". How do we make sense of this form of inference as rational? Some take IBE to be incompatible with the standard view of rational belief under uncertainty: Bayesianism. (For more on the topic of IBE and Bayesianism, see Henderson "Bayesianism and Inference to the Best Explanation", 2014, BJPS).

String theory is, some allege, confirmed by the fact that we have no plausible alternative theories to it. This, again, seems like a funny sort of inference. Although see (Dawid, Hartmann and Sprenger "The No Alternatives Argument", 2015, BJPS.) for a Bayesian reconstruction of the reasoning.

In short, scientists reason in all sorts of interesting ways, and if we take seriously the idea that scientific reasoning is largely rational, this provides us with many opportunities to attempt rational reconstructions of scientific reasoning using the tools of probability theory and the rest of the uncertain reasoners toolbox. Some kinds of reasoning that scientists engage in have proven more recalcitrant as regards formal modelling. For example, can we rationalise aesthetic judgements in science? (For more on this topic see Ivanova "Aesthetic Values in Science", 2017, Philosophy Compass).

The Bayesian/probabilistic approach to scientific reasoning has probably been the most studied: there are classic works like Howson and Urbach's "Scientific Reasoning: the Bayesian Approach" (2006, Open Court Publishing) and recent additions like "Bayesian Philosophy of Science" by Jan Sprenger and Stephan Hartmann (2019, OUP).

Much scientific reasoning is tentative, or defeasible, and, as Unterhuber and Schurz argue, probability theory does not provide a good model of such defeasible reasoning ("The new Tweety puzzle", 2013, Synthese). This is perhaps a reason to be concerned that a simple probabilistic picture can't be right. Perhaps we need to explore the plethora of alternative formal models in order to fully capture the range of inferential behaviours scientists engage in.

Henry Kyburg's broadly probabilistic, but non-Bayesian approach to scientific inference is outlined in detail in "Uncertain Inference" (Kyburg and Teng, 2001, CUP). By non-bayesian, here, I mean that conditional probability does not play a big role in the theory. Kyburg's approach takes seriously the idea that measurements we make in science are often only approximate, rather than precise, and that the same goes for statements about probability. (See also chapter 4 of Haenni et al "Probabilistic Logic and Probabilistic Networks", 2011, Springer).

Even more non-probabilistic approaches are available. For example, Wolfgang Spohn devotes several chapters of "The Laws of Belief" (2012, OUP) – his extended defense of the ranking function approach to rational belief – to rationalising inference about laws, ceteris paribus conditions and causal inference, all of which are important kinds of scientific theorising.

A lot of theorising about uncertain reasoning uses simple toy examples: marbles in urns, coin flips and so on. I have nothing against this approach, and I think it's important to have simple test cases to analyse (see my Reasoner column from November 2019), but there is a lot more to uncertain reasoning than that, and so I think it's worth exploring how much of scientific reasoning we can capture in our formal models.

Seamus Bradley
Philosophy, University of Leeds

Science Policy

Sexual harassment in academia gets attention in waves. Talking about it openly or reporting it, is still a big taboo. The situation also varies from country to country. Yet some aspects of harassment in academia need to be addressed more frequently. Studies indicate that women in academia experience more harassing behaviors than in industry or governmental positions, but are often not explicitly aware of them (Ilies et al., Pers.Psychol. 2003; 56:607-631). What is so characteristic about academia? The power structure of academia is a fruitful ground for different types of abuse. Sexual harassment in academia caries the mark of power demonstration.

It happens to people of all gender identities and sexualities. It can come top-down, but also bottom-up, and horizontally. In other words, one can be harassed by her/his superiors, but also by peers and even students. Unfortunately, these things happen more often than they are expressed.

Harassment of post-doctoral researchers is something that needs to be further addressed. They are junior academics with temporary positions which places them in a vulnerable situation. In addition, they are not registered as students and are a likely target for senior academics from other research centers. These factors can weaken their potential legal protection and experienced sexual predators are aware of that.

In such situations, the clear opinion of the community that will set and demand higher ethical standards is necessary. This should be done by breaking the silence about taboos and putting implicit pressure on the aggressors. It is our responsibility to raise awareness and condemn all types of abuse in academia. The topic might seem familiar to all of us, but in fact we address it way too little.

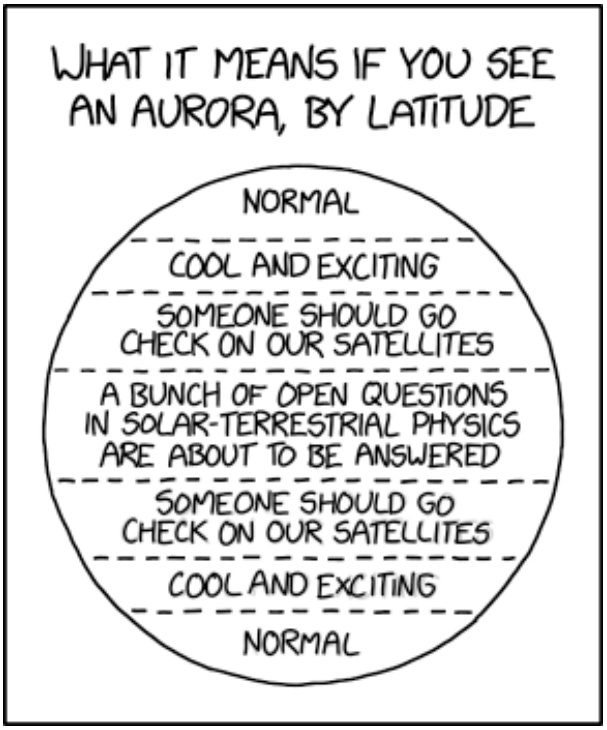
Conferences are exemplary events that need to be monitored

with respect to harassment. They give opportunities and pretext for predators to approach their victims in a casual setting that will not be an office, but rather a restaurant or even a hotel. Moreover, invitations for different scientific meetings and activities sometimes serve as a cover for abuse. As long as people wonder whether an invitation to a scientific event has a hidden agenda, we are in an alarming situation.

We all know that harassment can also be subtle. Comments, questions, and insinuations that address one's looks, choices, and intimate life can easily be toxic. In the academic culture, exactly because of the strong hierarchical structure, but also because of the frequent gender imbalance we need to raise our voices high and repeatedly warn against such discourse. Otherwise, the legitimate question arises whether the abusive behaviour perpetuates once it is so normalized in the common discourse. The consequences of harassment are not only that talented researchers might leave academia, but they also go deeper and can leave scars for life. Ultimately, we can never be sure how far an aggressor will go, and which lines might get cross if the abuse is not stopped timely.

Virginia Valian (Nature 2019 Oct; 574(7776):7) argues that all scientists should take responsibility as a community and try harder to recognize and prevent abuse. Legal measures vary in different countries. However, we can all work to improve the situation by setting professional standards and expecting others to act accordingly, but also by recognizing our previous mistakes and correcting them in the future. The veil of silence should be lifted, and victims should never be shamed. Moreover, it is not always easy for victims to come forward, recognize their rights and fight from them. In these situations, it is the responsibility of the rest of the community to act. We are all prone to mistakes, however, we can always improve.

Vlasta Sikimić
University of Belgrade



Events

December

EaUM: Explanation and Understanding within Mathematics, Vrije Universiteit Brussel, 5–6 December.
MMaS: Managing Misinformation About Science, Boston University, 6 December.
D-SiL: Decision-Support in Litigation, University of Edinburgh, 6 December.
MaIPiG: Models and Inference in Population Genetics, University of Warwick, 11–13 December,
.
CML: Causal Machine Learning, Vancouver, 13–14 December.
PoS&PoM: Philosophy of Science and Philosophy of Mind, University of Edinburgh, 16 December.
EpiVice: Epistemic Vices: Individual and Collective, University of Liverpool, 17 December.
Infer&Proof II: Inferences and Proofs 2, Paris, 17 December.
FoP: Formalization of proof, Paris, 18–19 December.

January

MetaExp: Metaphysical Explanation III, Lund University, 8–9 January.
PWoDD: Practical Workshop and Data Dive, Belfast, 21–22 January.

February

MchLrn: Machine Learning: Prediction Without Explanation? Karlsruhe Institute for Technology, Germany, 17–18 February.

Courses and Programmes

Courses

SSA: Summer School on Argumentation: Computational and Linguistic Perspectives on Argumentation, Warsaw, Poland, 6–10 September.

Programmes

APhil: MA/PhD in Analytic Philosophy, University of Barcelona.
Master Programme: MA in Pure and Applied Logic, University of Barcelona.
Doctoral Programme in Philosophy: Language, Mind and Practice, Department of Philosophy, University of Zurich, Switzerland.
Doctoral Programme in Philosophy: Department of Philosophy, University of Milan, Italy.
LogiCS: Joint doctoral program on Logical Methods in Computer Science, TU Wien, TU Graz, and JKU Linz, Austria.
HPSM: MA in the History and Philosophy of Science and Medicine, Durham University.
Master Programme: in Statistics, University College Dublin.
LoPhiSC: Master in Logic, Philosophy of Science and Epistemology, Pantheon-Sorbonne University (Paris 1) and Paris-Sorbonne University (Paris 4).
Master Programme: in Artificial Intelligence, Radboud University Nijmegen, the Netherlands.

Master Programme: Philosophy and Economics, Institute of Philosophy, University of Bayreuth.

MA in Cognitive Science: School of Politics, International Studies and Philosophy, Queen's University Belfast.

MA in Logic and the Philosophy of Mathematics: Department of Philosophy, University of Bristol.

MA Programmes: in Philosophy of Science, University of Leeds.

MA in Logic and Philosophy of Science: Faculty of Philosophy, Philosophy of Science and Study of Religion, LMU Munich.

MA in Logic and Theory of Science: Department of Logic of the Eotvos Lorand University, Budapest, Hungary.

MA in Metaphysics, Language, and Mind: Department of Philosophy, University of Liverpool.

MA in Mind, Brain and Learning: Westminster Institute of Education, Oxford Brookes University.

MA in Philosophy: by research, Tilburg University.

MA in Philosophy, Science and Society: TiLPS, Tilburg University.

MA in Philosophy of Biological and Cognitive Sciences: Department of Philosophy, University of Bristol.

MA in Rhetoric: School of Journalism, Media and Communication, University of Central Lancashire.

MA programmes: in Philosophy of Language and Linguistics, and Philosophy of Mind and Psychology, University of Birmingham.

MRes in Methods and Practices of Philosophical Research: Northern Institute of Philosophy, University of Aberdeen.

MSc in Applied Statistics: Department of Economics, Mathematics and Statistics, Birkbeck, University of London.

MSc in Applied Statistics and Datamining: School of Mathematics and Statistics, University of St Andrews.

MSc in Artificial Intelligence: Faculty of Engineering, University of Leeds.

MSc in Cognitive & Decision Sciences: Psychology, University College London.

MSc in Cognitive Systems: Language, Learning, and Reasoning, University of Potsdam.

MSc in Cognitive Science: University of Osnabrück, Germany.

MSc in Cognitive Psychology/Neuropsychology: School of Psychology, University of Kent.

MSc in Logic: Institute for Logic, Language and Computation, University of Amsterdam.

MSc in Mind, Language & Embodied Cognition: School of Philosophy, Psychology and Language Sciences, University of Edinburgh.

MSc in Philosophy of Science, Technology and Society: University of Twente, The Netherlands.

MRes in Cognitive Science and Humanities: Language, Communication and Organization: Institute for Logic, Cognition, Language, and Information, University of the Basque Country (Donostia San Sebastián).

Open Mind: International School of Advanced Studies in Cognitive Sciences, University of Bucharest.

Research Master in Philosophy and Economics: Erasmus University Rotterdam, The Netherlands.

Jobs and Studentships

Jobs

Lecturer: i, n. Philosophy of Public Health/Epidemiology, University College Corkdeadline 5 December

Post Doc(s): in Ethics and Epistemology of Science, Leibniz University Hannover & Bielefeld University, Germany, deadline 12 December.

Chair: in Data Science, University of Bristol, deadline 6 January.

Preofessor: of Probability, University of Warwick, deadline 17 January.