



Artificial Intelligence and Augmented Intelligence for Automated Investigations for Scientific Discovery

AI3SD Interview with Dr Simone Vannuccini
15/01/2021
Online Interview

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Contents

1	Interview Details	1
2	Biography	1
3	Interview	2

1 Interview Details

Title	AI3SD Interview with Dr Simone Vannuccini
Interviewer	MP: Michelle Pauli - MichellePauli Ltd
Interviewee	SV: Dr Simone Vannuccini - University of Sussex
Interview Location	Online Interview
Dates	15/01/2021

2 Biography



Figure 1: Dr Simone Vannuccini

Dr Simone Vannuccini: ‘Building conceptual models is like painting on canvas’

Simone Vannuccini is a lecturer in the Economics of Innovation at the Science Policy Research Unit (SPRU), University of Sussex Business School. At the University of Sussex, Dr Vannuccini co-convenes the Research Mobilisation Group on Artificial Intelligence, is the deputy director of the Future of Work Hub, and the convenor of the SPRU Freeman Seminars. His research focuses on microeconomics of innovation and more precisely on the ‘regular irregularities’ of technical change: in particular, he studies the nature of ‘general purpose technologies’ and their impact on industrial dynamics.

In this Humans of AI3SD interview he discusses shedding light on the hype of AI, the challenges of academic tribes and community building, and the future of work.

3 Interview

MP: What’s been your path to where you are today?

SV: I’m currently a lecturer in Economics of Innovation at the University of Sussex. I’m studying how technologies impact the socio-economic system and what forces are at work between what we want to do, what the economic factors can do and how technology enables or constrains us in doing that.

I started my academic career in Florence, Italy, where I’m originally from. I’ve always been interested in trying to understand the world. I started my Master’s in Development Economics, but also covered some Economic Anthropology and Innovation Economics. I found this perspective very inspiring so I continued with a PhD on Innovation Economics in Germany before moving to Sussex.

Despite what is perhaps the external view of what economists do, economists are very much split into “tribes”. And so if you study the economy through a specific lense, which in my case is called the evolutionary approach to economics, there are very few places where these tribes are represented. One is Friedrich Schiller University Jena where I was in Germany, and another one is where I currently am – the Science Policy Research Unit at the University of Sussex.

MP: And what about your current research? What are you working on?

SV: I became interested in the concept of ‘general purpose technology’. This is the abstract idea that some technologies become ubiquitous or pervasive in the economy, so how does that work, how do they appear, how do they diffuse? It covers many artefacts, including ICTs but also the steam engine. Nowadays, you study artificial intelligence, robotics, or new materials, and check whether these fit into the scheme of general purpose technology.

From the Economics of Innovation viewpoint, these technologies impact deeply the socio, technological, and economic system. One dimension of this is the way in which we work. The so-called “future of work” has many aspects: how work itself will change, the type of tasks we will be engaging in and how we engage in these tasks. Covid has given another big boost to that transformation, such as where we will be working, how we’re going to interact, how we interact between humans and machines and how all these elements combine. I’m Deputy Director of the Future of Work Hub at the University of Sussex, which is a network of researchers who seek to provide this multidisciplinary view on how the world of work is going to evolve. One area I’m looking at is digitalisation: how digital technologies enable or change us by impacting what we do, what we can do, the relative cost and benefits of executing some work tasks. In the Hub, we try to show that there are more points of commonalities than differences between different areas of research so to push for a cross-fertilisation of research activities. There is also some external impact on policymakers and companies.

Going back to general purpose technology, we look at how is it that one technology became ubiquitous? Nowadays, this means mostly artificial intelligence. The idea is not to study how robots are taking over the world, but what the nature of artificial intelligence technologies really is, and what is the type of domains of application that artificial intelligence practically has.

The most recent work on AI says that AI is a general purpose technology, which I find to be a

limited or narrow definition. If we want to have a good, wide, all-encompassing perspective of how this technology is evolving, which is important because some actors are controlling or shaping the way in which this technology develops, then we need to have a more systemic look at that. My most recent work with Ekaterina Prytkova is on how we should frame artificial intelligence as a ‘large technical system’, a sort of broad infrastructure that permeates many dimensions of our daily lives and layers up on existing technological strata, in particular software technologies, ICTs, and the internet.

MP: What are the broader implications of what you’re doing? You mentioned the impact that AI is going to have, possibly is already having, on our lives. How is your work going to have an impact on that?

SV: With AI, my strong drive is to shed some light on what is a very hyped phenomenon. Despite the fact that researchers are allocating big efforts to develop algorithms or understand how AI evolution might impact some specific fields of the economy and society, in the end we are still talking about how robots are replacing our jobs, or “AI will become super intelligent and save us all”, or “AI will become super intelligent and destroy us all.” There is instead a much more fine-grained and complex dynamics at work, in which workers are not really substituted. What we label robots are very sophisticated, malleable pieces of capital that do not necessarily show intelligence yet – rather, they are a continuation of previous waves of industrial automation. Instead, AI algorithms are mostly applied to improve targeting in advertising markets that monetise on our attention. So, you see that the impact that we are experiencing from AI is much more kaleidoscopic in a sense – it’s not really a matter of people stopping working, it is a matter of companies (among which the big technological giants) using AI for ads and service provision.

One thing that I think is also important to stress is how much this mechanism is not new but rather extended at a scale that we’ve never seen before. The fact that we use techniques to understand what consumers want is as old as the fact that humanity exchanges goods. What’s new is the scale at which this is happening and the very detailed, sometimes personalised level on which this is happening.

Every innovation reduces some types of costs, such as transportation costs. And when some costs go down, social and economic activities change and re-arrange. AI techniques lower the cost of prediction. It’s much cheaper because it is automated and it’s done digitally. This leads to a massive investment of resources into that, which then changes the incentives and the constraints related to doing certain things. That, in turn, changes society.

MP: What particular challenges do you face in your research?

SV: There are a couple of challenges. One has to do with the disciplinary aspects. As economics is a field very rich in approaches, niches and ways of seeing the world, sometimes it’s very hard to bring a new consensus perspective on things. My work on AI I mentioned combines two main concepts, one from economics and one from the sociology of technology. That sounds potentially interesting (in line with the idea of cross-fertilisation) but there is a risk that both sides - the economists and the sociologists - feel they are being attacked in their own (conceptual) homes. Your effort is to build the bridge but the two sides of the bridge want to destroy it. So you need to find non-linear, dynamic strategies to make people buy your perspective and show that the bridge is a better or more useful way to address some problems.

The other challenge is to fight the hype around, for example, robots becoming intelligent and taking over while still keeping your audience listening when you say, “Hey, you know that AI is pretty much software-done-different, advertising market algorithms, and also computer-aided science and discovery processes, but not much else?” Many don’t want to hear that. It’s very hard sometimes to convey the complexity of some mechanisms and to convey that both externally and within the tribes of academia.

You need to spend a lot of time engaging in “community-building” which then requires knowing different jargons, different methods – it is quite a task! However, I think it is worth it because in the end, we all want the advancement of knowledge accumulation and human understanding. But I always see that as a form of Politics in science. Politics with a capital P, meant as the art and craft of obtaining the best possible outcome out of the need to compromise between very different and sometimes contrasting views.

MP: What advice would you give to early-career researchers in your field?

SV: Know the playing field. When you enter academia you need to know that there are different communities and you need to learn the rules of the game of engaging with different fundamental premises, different jargon and perspectives. Don’t become absorbed in one perspective while you do your PhD only to find out at the end of the PhD that in the academic labour market people think in a totally different way and you are a complete mismatch. Understanding the broader academic rules of the game is very important.

Never stop addressing the fundamental theoretical issue. Research communities have a life cycle in which you have the big names introducing radical novelties and then you have cohorts of younger researchers who do more incremental research. The latter is easier for the early-career researcher because you then can have some quicker publications or a bit of recognition. But then, the community itself loses its push for theoretical deep analysis while this should not be forgotten, because from this depends a discipline’s success and momentum. So, study, study, study, and explore the possibility to contribute at the deeper theoretical level.

Always keep a bird’s eye view on the discipline, because although one person can pursue her or his own career, we are always part of a bigger game, of a bigger mission.

Look at the world as something to discover, something to unpack, something that is really, really interesting and which we have the chance to improve or to understand, to capture with our intellectual capabilities. I’m always in search of the new theory that can explain something because this is a form of art in the end, you know? When you build these mathematical models or conceptual models, it’s like painting on canvas. You capture the world in some way, and it’s very motivating.