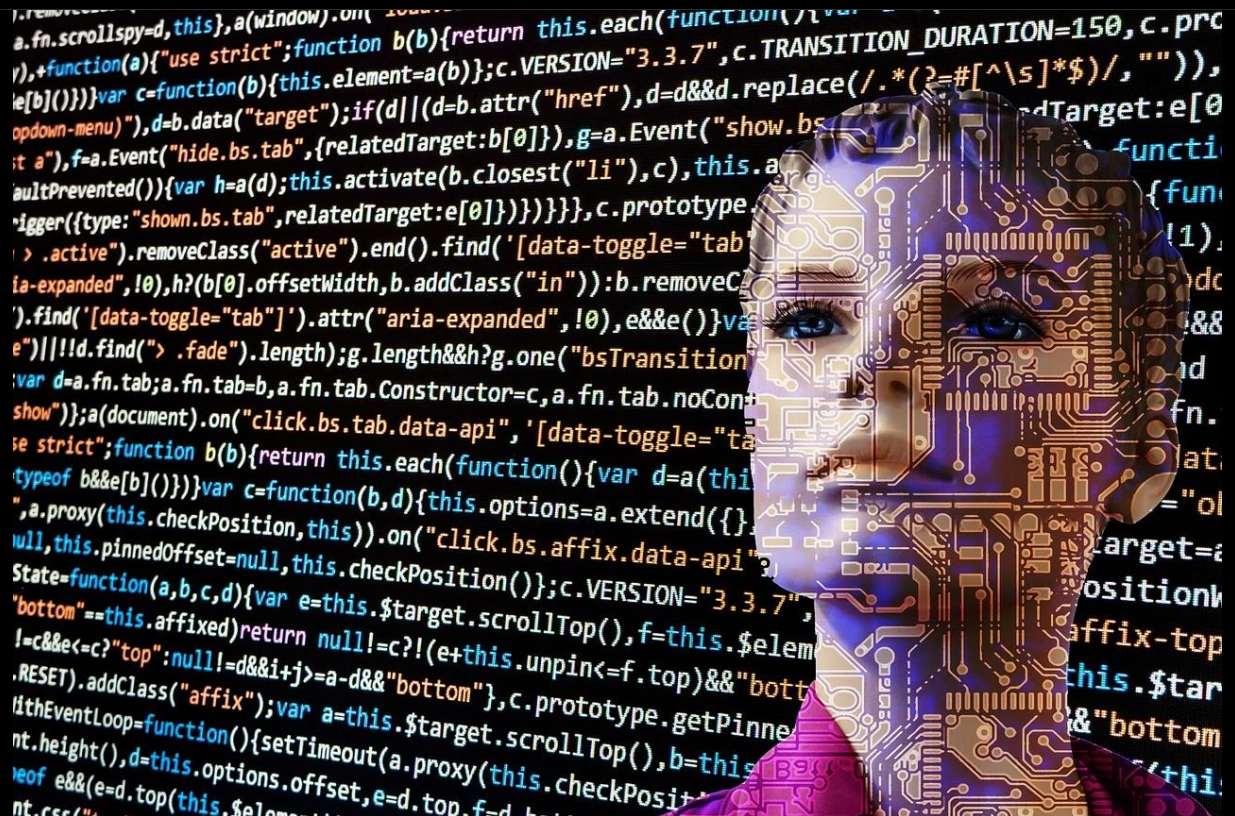# The Future of Work

Automation & Employment

Social Situation Monitor
Research Seminar

Friday 10 November 2017
12:00 – 16:10

Hall 300
The Square
Glass Entrance
Mont des Arts/Kunstberg
B-1000 Brussels

European Commission

LSE Enterprise

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Speakers &abstracts

Robots at work: A note on the trends of automatable and non-automatable employment shares in the EU

Speaker	Grace Lordan Associate Professor at the London School of Economics and Political Science (UK)
Bio	Grace Lordan is an associate professor at the London School of Economics (LSE). She is a research associate at the Center of Economics Performance (LSE), the Institute of Research on Labor (Bonn), the Behavioral Research Hub (LSE) and the International Inequalities Institute (LSE). Grace's interests lie in working on consultancy projects which put economics to work in the real world, where theory meets application. These include: Designing incentive-based interventions that maximize an employee's productivity; Advising firms on initiatives they can use to achieve diversity and inclusion; Informing on evidence that can help firms recruit, retain and evaluate their employees objectively and nudges that make it more likely that an employee will comply with an organisation's rules.
Abstract	This work will document for 1983-2015 (years available in the EULFS data) the share of non-automatable and automatable jobs in EU countries. Specifically, we distinguish between occupations that are intensive in automatable and non-automatable tasks by drawing on definitions provided in Autor and Dorn (2013) and Autor et al. (2015). This will highlight whether different countries have experienced different trends in labor allocation away from automatable jobs. The definitions put forward by Autor and Dorn (2013) and Autor et al. (2015) are intuitive for a retrospective analysis, given the occupations identified as automatable are very credible. However, there is a seismic change on the horizon with respect to the jobs that will be automated in the near future. That is, many more occupations that employ low-skill workers are on track to be automated. Therefore, we will repeat the analysis, following Lordan (2017) re defining occupations as automatable if there has been a lot of research and development in creating substitutes (as defined by patent activity on Google patents), plus some success with these substitutes on the actual labor market.

The impact of industrial robots on workers

Speaker	Wolfgang Dauth Assistant Professor at the University of Würzburg (Germany)
Bio	Wolfgang Dauth is assistant professor of empirical regional and international economics at the University of Wuerzburg since October 2014 and senior researcher at the Institute for Employment Research, Nuremberg, since April 2008. He studied economics at the University of Erlangen-Nuremberg from 2003 to 2008. He then received a scholarship at the joint graduate programme of the IAB and the University of Erlangen-Nuremberg, where he has been awarded his doctorate degree in July 2012. In 2011 and 2014, he worked as a visiting scholar at the John F. Kennedy School of Government at Harvard University and the Massachusetts Institute of Technology in Cambridge, USA. His research focuses on applied topics in labor, international, and urban economics, such as commuting and the impact of international trade and technological change on the German labor market.

Abstract	We study the impact of rising robot exposure on the careers of individual manufacturing workers, and the equilibrium impact across industries and local labor markets in Germany. We find no evidence that robots cause total job losses, but they do affect the composition of aggregate employment. Every robot destroys two manufacturing jobs. This accounts for almost 23% of the overall decline of manufacturing employment in Germany over the period 1994–2014, roughly 275,000 jobs. But this loss was fully offset by additional jobs in the service sector. Moreover, robots have not raised the displacement risk for incumbent manufacturing workers. Quite in contrast, more robot exposed workers are even more likely to remain employed in their original workplace, though not necessarily performing the same tasks. The aggregate manufacturing decline is solely driven by fewer new jobs for young labor market entrants. This enhanced job stability for insiders comes at the cost of lower wages. The negative impact of robots on individual earnings arises mainly for medium-skilled workers in machine-operating occupations, while high-skilled managers gain. In the aggregate, robots raise labor productivity but not wages. Thereby they contribute to the decline of the labor income share.

Are robots stealing our jobs?

Speaker	Marco Vivarelli Professor of Economics, Director of the Institute of Economic Policy at the Università Cattolica del Sacro Cuore, Milan (Italy)
Bio	Marco Vivarelli is full professor at the Catholic University of Milano, where he is also Director of the Institute of Economic Policy. He is Professorial Fellow at UNU-MERIT, Maastricht; Research Fellow at IZA, Bonn; Fellow of the Global Labor Organization (GLO). He is Editor-in-Chief of the Eurasian Business Review, Editor of Small Business Economics, Associate Editor of Industrial and Corporate Change, Associate Editor of Economics E-Journal, member of the Editorial Board of Sustainability. He is author/editor of various books and his papers have been published in journals such as Cambridge Journal of Economics, Canadian Journal of Economics, Economics Letters, Industrial and Corporate Change, International Journal of Industrial Organization, Journal of Economics, Journal of Evolutionary Economics, Journal of Productivity Analysis, Labour Economics. His research interests include the relationship between innovation, employment and skills; the labour market and income distribution impacts of globalization; the entry and post-entry performance of newborn firms.
Abstract	In this work, we test the employment impact of distinct types of innovative investments using a representative sample of Spanish manufacturing firms over the period 2002-2013. Our GMM-SYS estimates generate various results, which are partially in contrast with the extant literature. Indeed, estimations carried out on the entire sample do not provide statistically significant evidence of the expected labor-friendly nature of innovation. More in detail, neither R&D nor investment in innovative machineries and equipment (the so-called embodied technological change, ETC) turn out to have any significant employment effect. However, the job-creation impact of R&D expenditures becomes highly significant when the focus is limited to the high-tech firms. On the other hand – and interestingly – ETC exhibits its labor-saving nature when SMEs are singled out.

Digitalisation and the Future of Work: Macroeconomic consequences for tomorrow's employment, unemployment and wages

Speaker	Ulrich Zierahn Senior Research at ZEW (Germany)
Bio	Ulrich Zierahn is a Researcher at the ZEW Research Deparment "Labour Markets, Human Resources and Social Policy" in the Reseach Area "Changing Labour Markets" since October 2012. He became Senior Researcher in October 2014. His research currently focuses on the consequences of technological change, international trade and offshoring for both, the dynamics of individual labour market careers and for the economic performance of regional labour markets. Moreover, he investigates the effects of agglomeration of economic activities on the disparities between regional labour markets. Ulrich Zierahn studied economics at the University of Kassel. After his graduation in 2010 he worked as a research assistant based on a cooperation between the University of Kassel and the Hamburg Institute of International Economics.
Abstract	There is a controversial public debate on the consequences of an increasingly digitalized world of work on the society and economy. Fears are raised that jobs might be increasingly at risk due to the use of machines and intelligent algorithms. These fears are fueled by studies which suggest that almost every 2nd job might be automatable. In the public discussion, these technological potentials are often misinterpreted as potential employment effects. Macroeconomic employment effects of technological change, however, depend on adjustment processes, such as the creation of new jobs and industries. Studies which take into account such mechanisms typically find little effects of automation and digitization on aggregate employment, although they usually also report large structural changes. The key question therefore is not how many jobs, but which jobs we will have in the future. Recent results suggest that automation and digitization lead to a large restructuring of occupations, industries and job tasks. This raises the pressure to adapt particularly for low-qualified workers, as the growing jobs typically require higher qualifications than declining jobs. Digitization may thus raise inequality and reduce labor market opportunities for low-qualified workers.

Speaker	Federico Biagi
	Senior Researcher at the Joint Research Centre (Spain)
Bio	Federico Biagi is currently CRELL team leader at JRC, Ispra, while on leave from the Department of Economics and Management at the University of Padova, Italy. He has experience and skills in general micro-economic theory, public finance, economics of education, labour economics, applied economics, industrial organization, growth theory, econometrics and impact assessment. He has state of the art experience in working with large datasets (households and enterprise panels, labour force surveys, PISA and PIAAC, longitudinal aggregate and industry databases). From 2013 to 2016 Federico Biagi has led two Work-Packages in the research project "European Innovation Policies for the Digital Shift" (EURIPIDIS), and is currently participating in various research projects on the role of digitalization in education. In 2017 Federico Biagi has been in charge of a Work-Package in the context of the research project Competence Framework 2, focused on "Digitalization, New Skills and the Labour Market" (in collaboration with DG EMPL).
Abstract	This project focuses on the robustness of measures for routinization in the EU. We use different measures of routine intensity and different datasets (EWCS, PIAAC, PDII, O*NET, plus the LFS) to provide a broad picture of routinization in the EU, also focusing on across-time changes. We do not propose a new definition of routinization. We take the most prevailing ones and then 1) for each proposed measure we compare the results obtained with the different dataset used to measure routine task (EWCS, PIAAC, PDII, O*NET); 2) for a given dataset we compare the results obtained from the different measures of routine tasks. Using the European Working Conditions Survey we can also disentangle the change in the Routine index into changes in routine intensity within occupations and changes in routine intensity driven by changes in employment between occupations.