

# What is the Price of a Skill?

## Skill Foresight with Platform Data

ETF Skills Lab Network of Experts Webinar - November 7th 2022

**Dr Fabian Stephany**

(fabian.stephany@oii.ox.ac.uk)



@fabian\_stephany

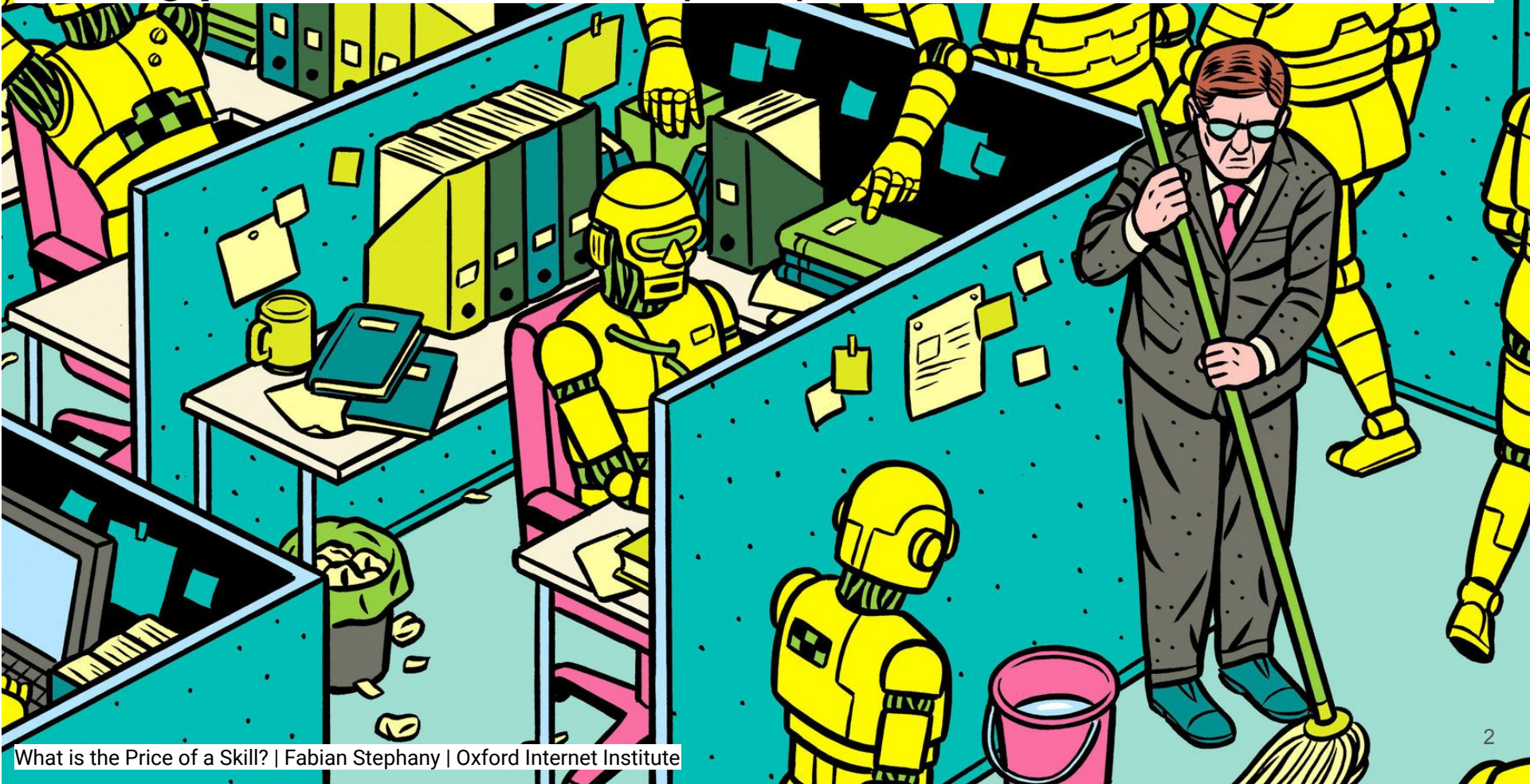


ALEXANDER VON HUMBOLDT  
INSTITUTE FOR INTERNET  
AND SOCIETY

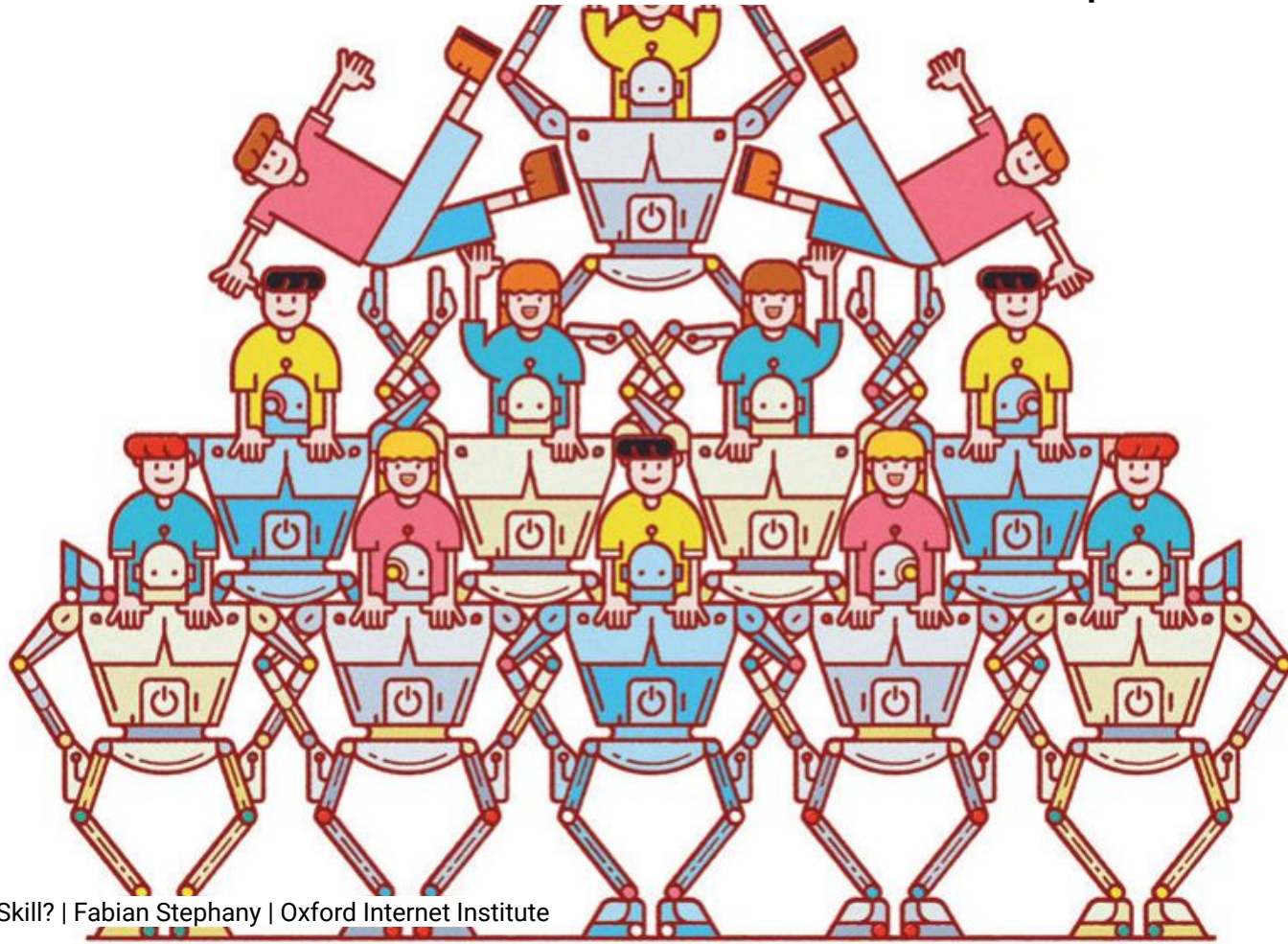




**The big picture...** automation puts pressure on firms and workers.



**The big picture...** automation allows us to outsource repetitive tasks.





# The big picture... is complicated.

Stephany & Luckin (2022)

Technological change has at least two effects:

- Old skills are automated ([Goos et al., 2019](#); [Acemoglu & Autor, 2011](#))
- New skills are required ([Autor, 2015](#))

This leads to economic inequality ([Card & DiNardo, 2002](#)) and retards growth ([Krueger & Kumar, 2004](#)) via:

- Actual skill gap ([Baldwin & Forslid, 2020](#))
- Digital skill mismatch ([De Mauro et al., 2018](#))



The background is a dark blue field filled with a complex network of glowing blue and white lines, resembling a digital or neural network. Interspersed among these lines are strings of binary code (0s and 1s) in a lighter blue color. Some small red and blue squares are also visible, adding to the digital aesthetic.

# How to find valuable skills and what determines their value?




# Online generated data is a valuable resource for labour market research.

Data Source	Demand Side	Supply Side	Price Information	Broad Coverage
Online Job Vacancies				
Networking Sites				
Online Labour Platforms				

*Table 1 Compared to data from online job vacancy sites and career portals, online labour market data allow for the study of both the demand and supply side of work, including relevant information on prices. Source: Stephany & Luckin (2022).*

# Online labour platforms are markets of successful skill recombination.

([www.onlinelabourobservatory.org](http://www.onlinelabourobservatory.org))



Flavia G.

Machine Learning | Data Visualization | Python | R

United Kingdom

\$70.00 / hr

\$30k+ earned


96% Job Success

TOP RATED

I have a PhD in Statistics and more than nine years of experience in developing mathematical and statistical models in a professional setting both in Python and in R. I am also very interested in acad ...

Suggested because they worked on 8 jobs that match your search.

Python • R • Machine Learning • Deep Learning • 6 more



Ajay T.

Data Scientist, Data Engineer and Data Visualization Expert

India


\$50.00 / hr

100% Job Success

TOP RATED

..... I am embarking on my freelancing journey after working for a decade and a half in the top analyt ...

SQL • Python • Tableau • Statistics • 2 more



Shreya B.

Data Science |Machine Learning - Open for Full Time Job

India

\$25.00 / hr

\$20k+ earned

85% Job Success

TOP RATED

CONCEPT/ FRAMEWORK : Data Science, Machine Learning, Artificial Intelligence, NLP, IVR, Automation, scientific modelling, ChatBot LANGUAGE - Java, Python, Scala, PySpark, R, RSpark, TensorFlow, sc ...

Suggested because they worked on 6 jobs that match your search.

Data Science • Machine Learning • Python • Scala • 6 more

< Previous

1 2 3 4 5 ... Next >

## The Online Labour Index 2020

The Online Labour Index (OLI) is the first economic indicator that provides an online gig economy equivalent of conventional labour market statistics. It measures the supply and demand of online freelance labour across countries and occupations by tracking the number of projects and tasks across platforms in real time. Its 2020 update (OLI 2020) introduces wider coverage, new interactive visualizations, and easy access to data.



Explore the OLI 2020

## Research



### Is tech 'taking over'? How the online workforce shifts towards tech work

By Susanne Klausung and Fabian Stephany

In 2021, we released the Online Labour Index 2020 (OLI 2020) which allows for new forms of analyses regarding the development of online platform[...]



### How big is the online labour workforce? Our data-driven approach to this tricky question

Development in digital communication technologies has made transacting work remotely easier and more economical. Online labour platforms, also known as online outsourcing, crowd-work, or online



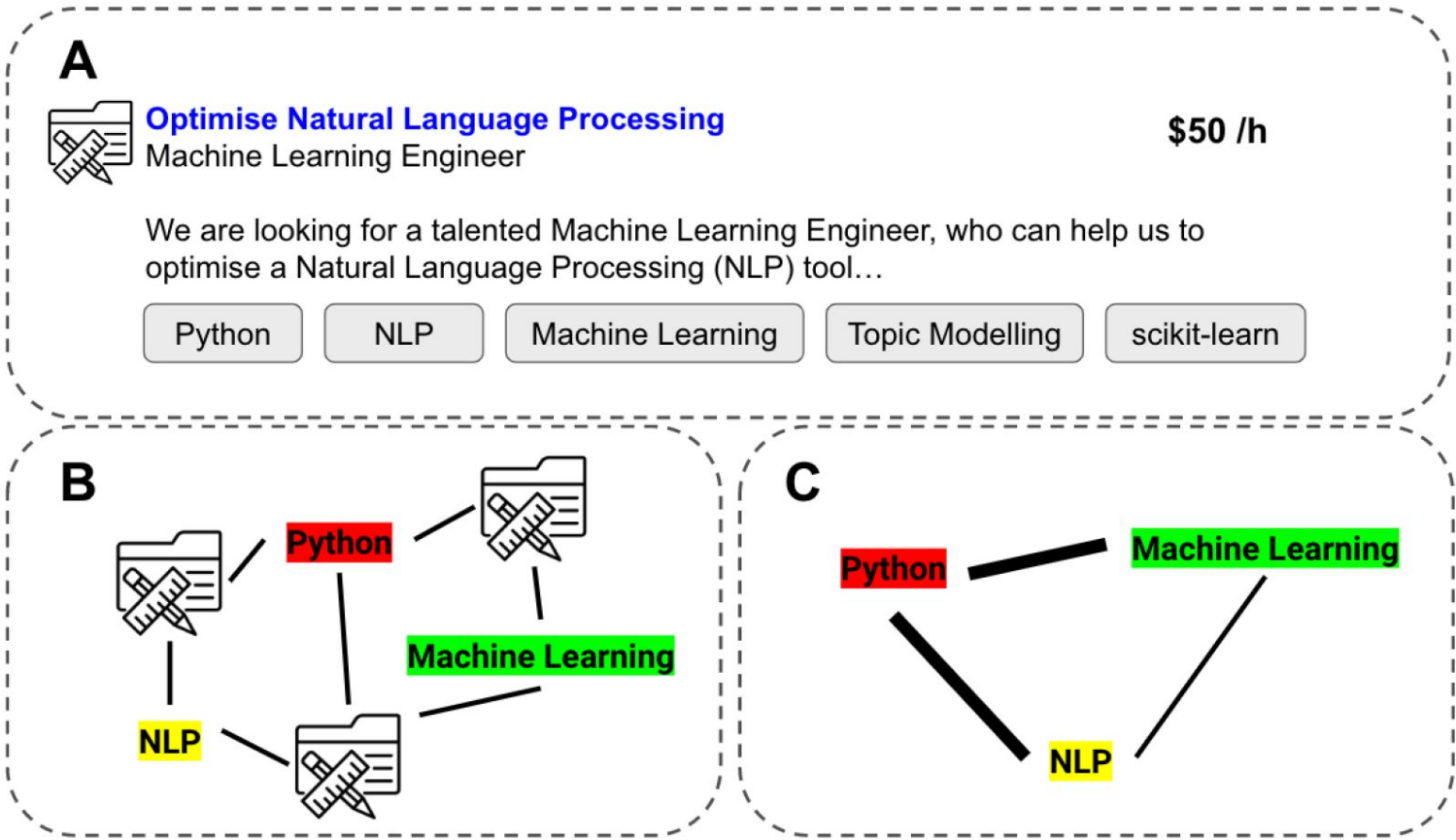
### ILO report: The role of digital labour platforms in transforming the world of work

Digital labour platforms have become a pervasive feature of contemporary society. They allow us to order food, arrange a ride, or buy remote freelancing services online. But how are they[...]

What is the Price of a Skill? | Fabian Stephany | Oxford Internet Institute

# Networks can be constructed between workers and their skills

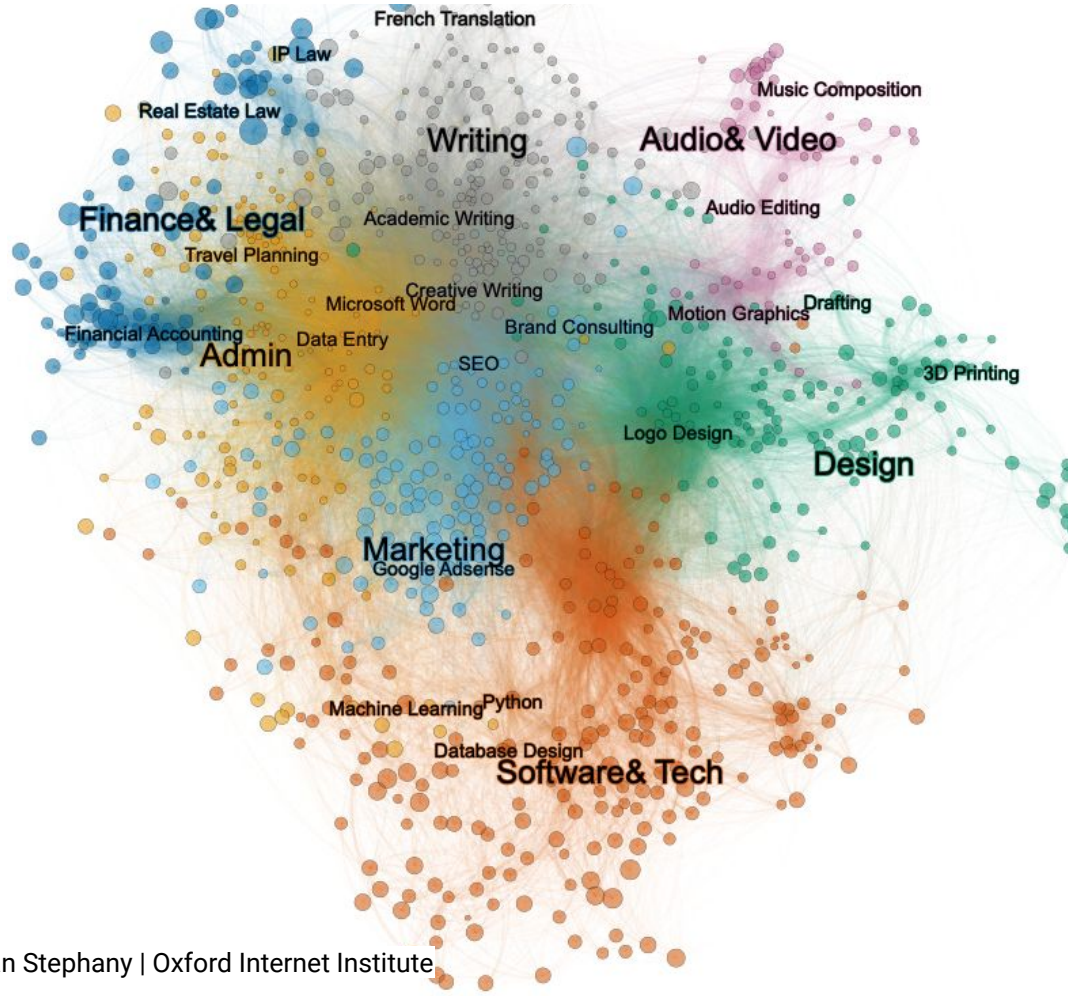
(Stephany et al., 2022)





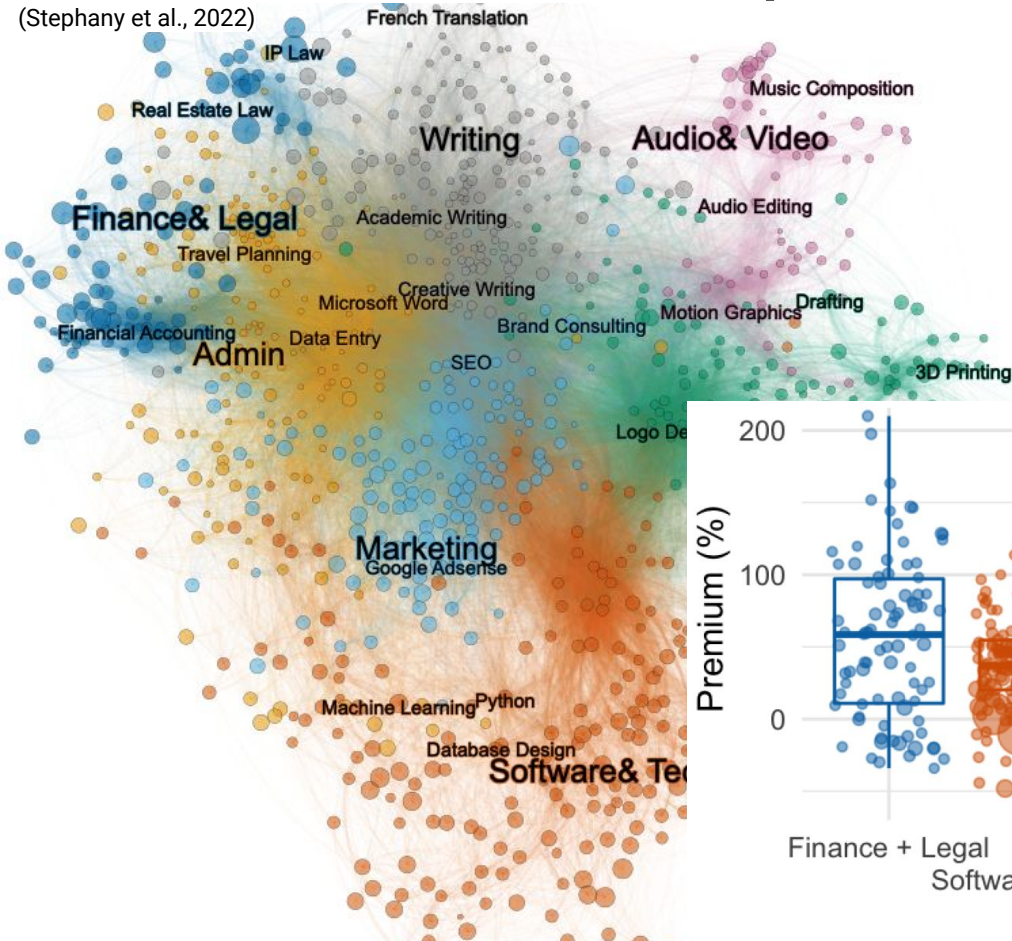
# Networks can be constructed between workers and their skills.

(Stephany et al., 2022)

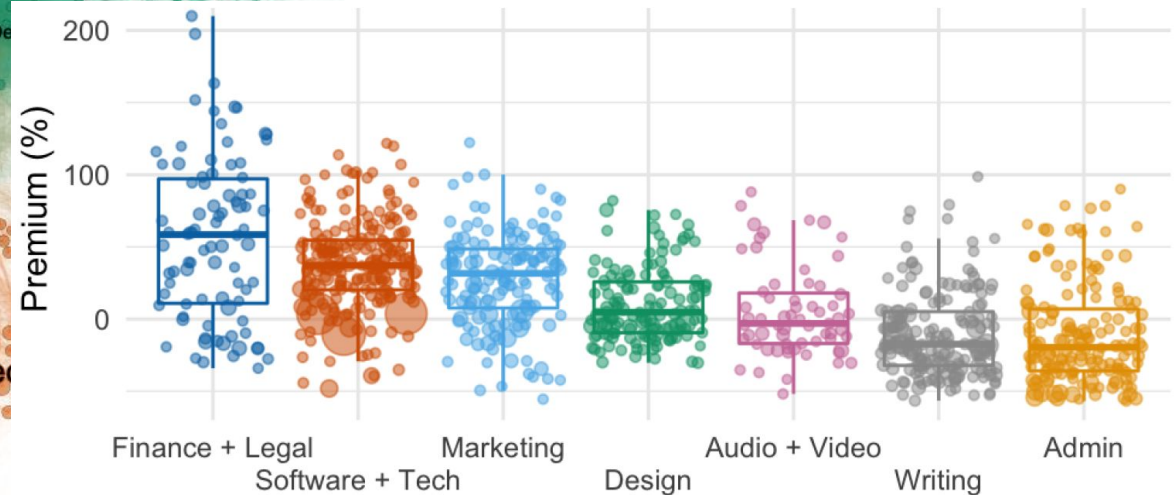


# Skill communities define the premium of a skill.

(Stephany et al., 2022)



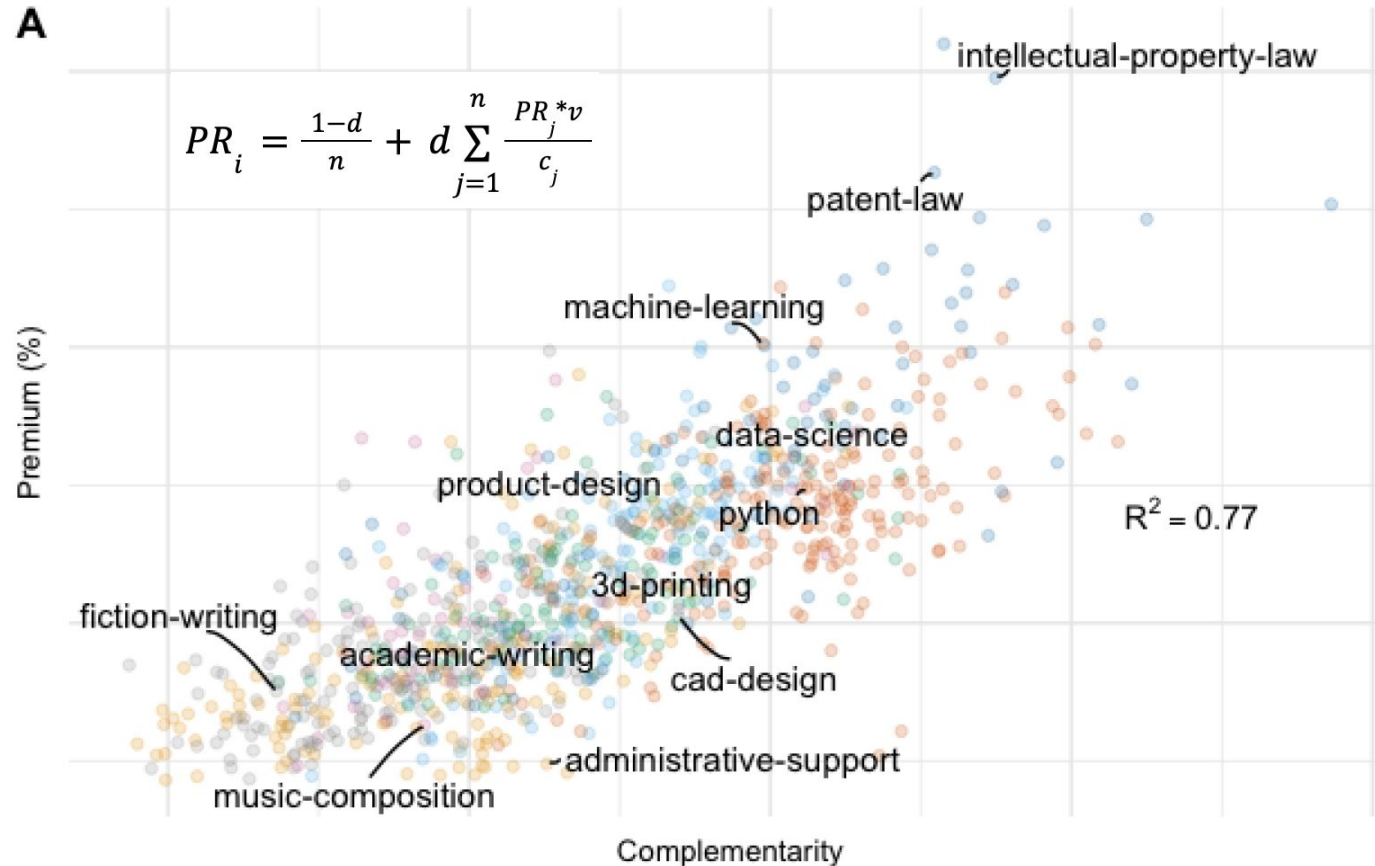
$$\text{premium} = \frac{\sum_{i=1}^n \text{wage}/n}{\sum_{j=1}^m \text{wage}/m} - 1$$





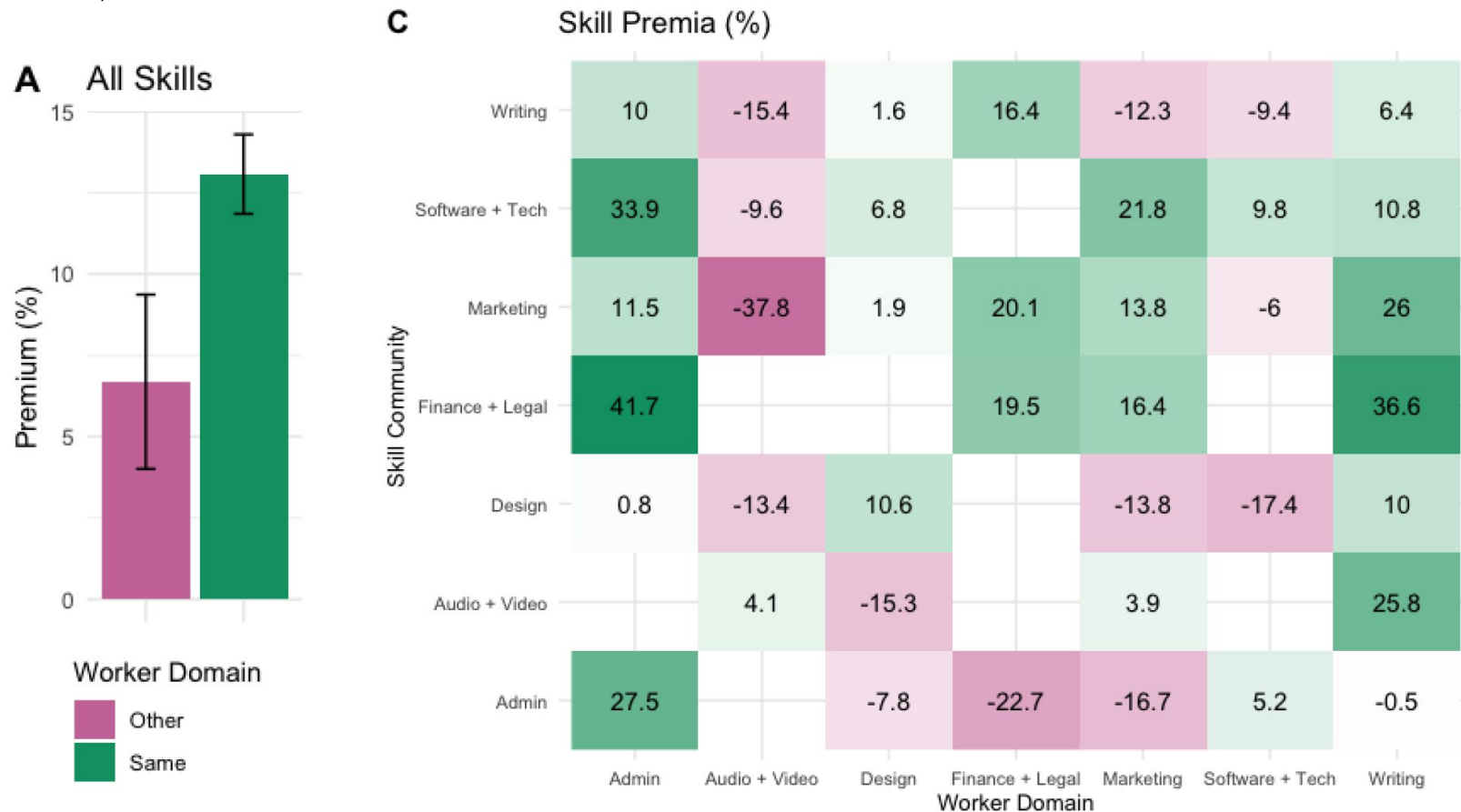
# Complementarity is positively related with a skill's premium.

(Stephany et al., 2022)



# The premium of a skill depends on the skill background of the worker.

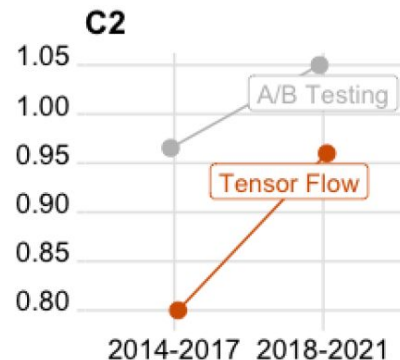
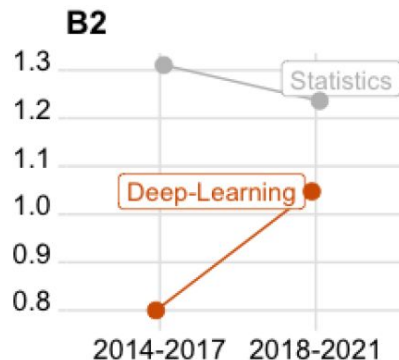
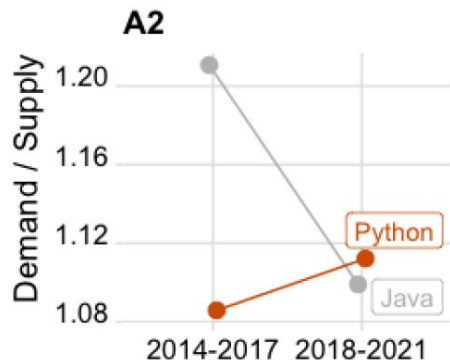
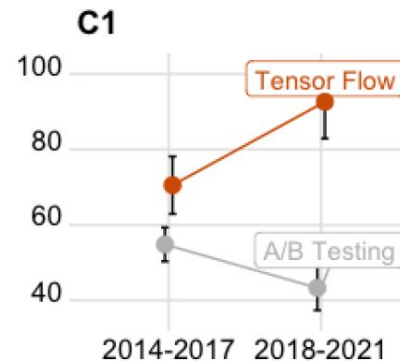
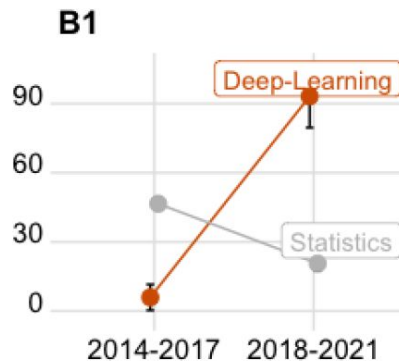
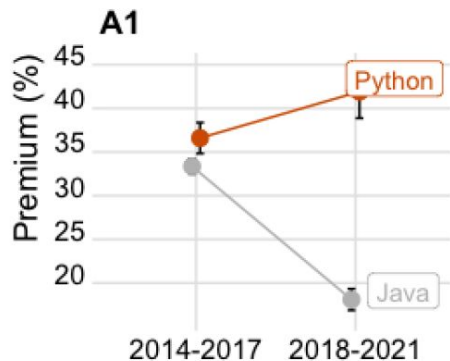
(Stephany et al., 2022)





# Over time, skills gain and lose value, depending on supply and demand.

(Stephany et al., 2022)



# What is the Price of a Skill?

## Skill Foresight with Platform Data

- 1) Technology changes task compositions demanding for agile reskilling.
- 2) Online generated data can be a valuable resource for labour market and skill research.
- 3) The value of a skill depends on its complementarity: how it can be combined with other skills.



[bit.ly/olmskills](https://bit.ly/olmskills)



@fabian\_stephany



[fabian.stephany@oii.ox.ac.uk](mailto:fabian.stephany@oii.ox.ac.uk)



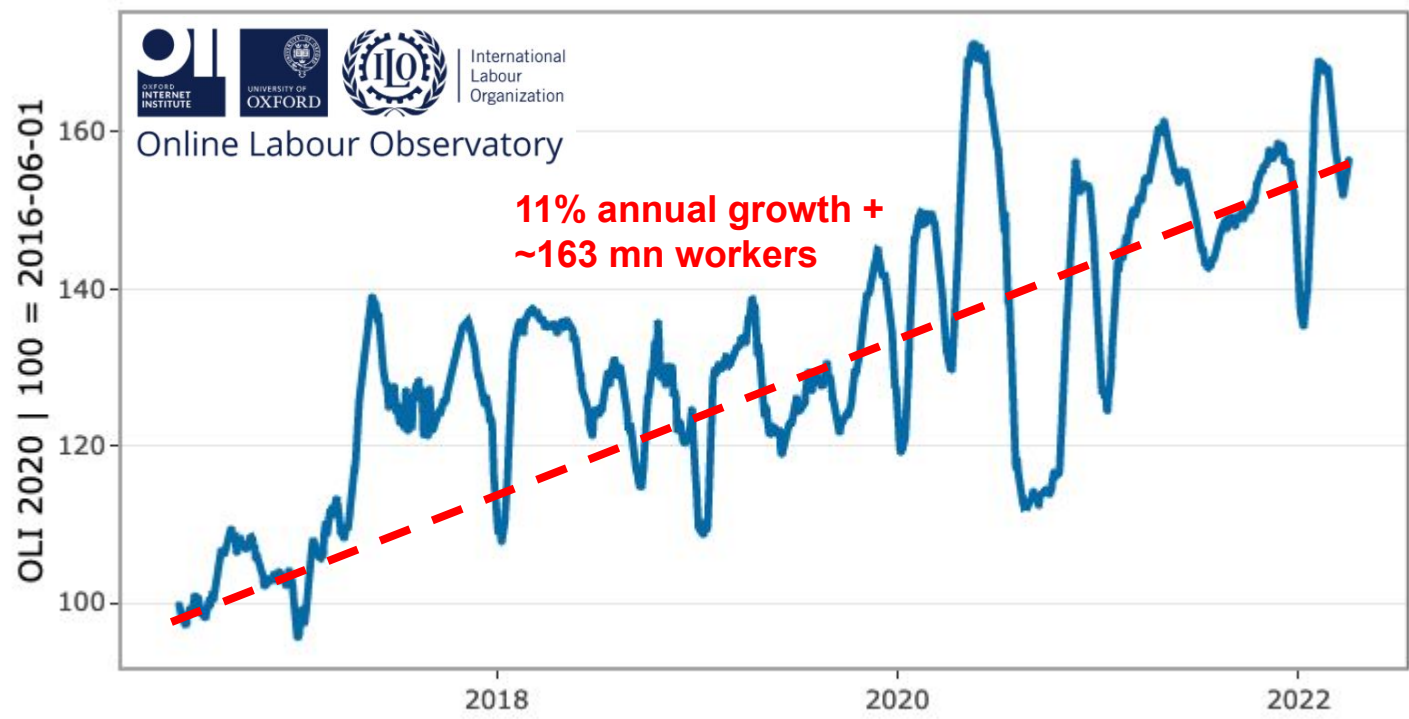
[www.skillscale.org](http://www.skillscale.org)



# Backup Slides

# Global demand for remote platform work is growing steadily.

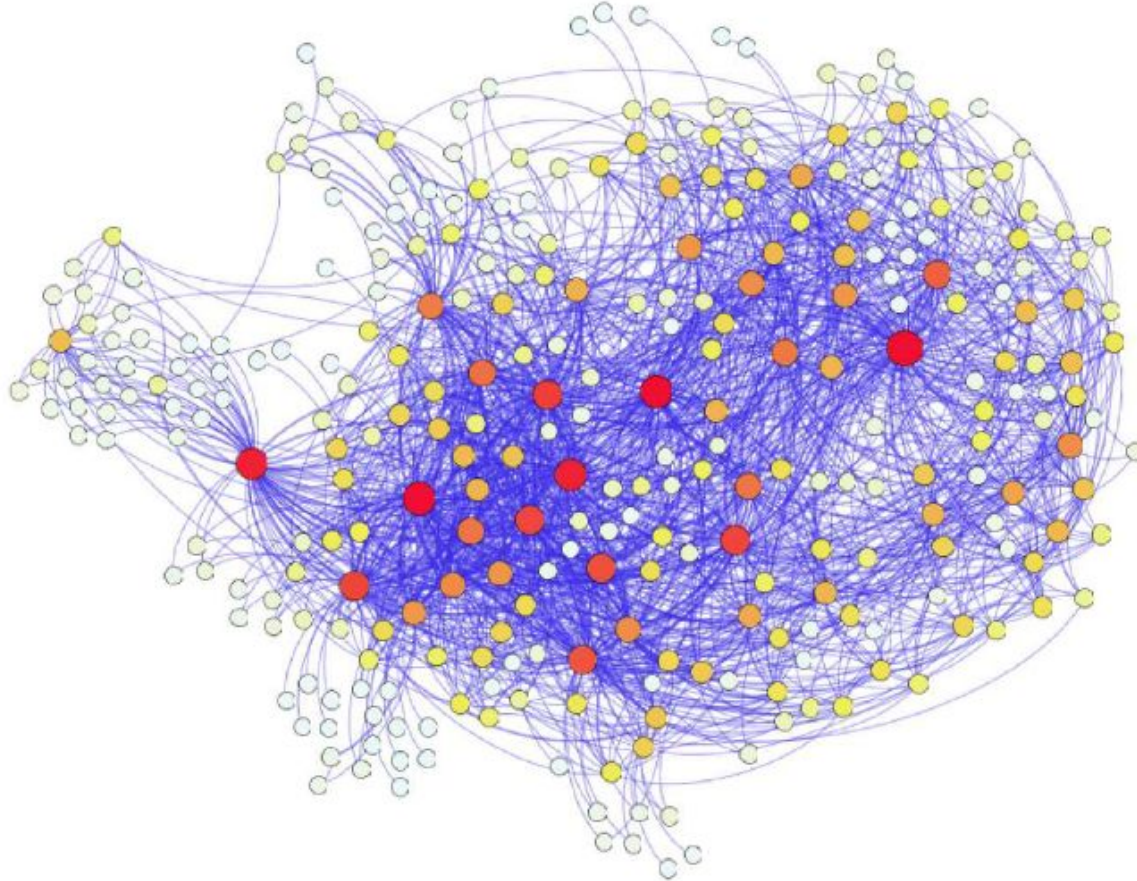
([www.onlinelabourobservatory.org](http://www.onlinelabourobservatory.org))



Source: OLI 2020 | [onlinelabourobservatory.org](http://onlinelabourobservatory.org)

# In a network, relevance is often shaped by “strategic positioning”

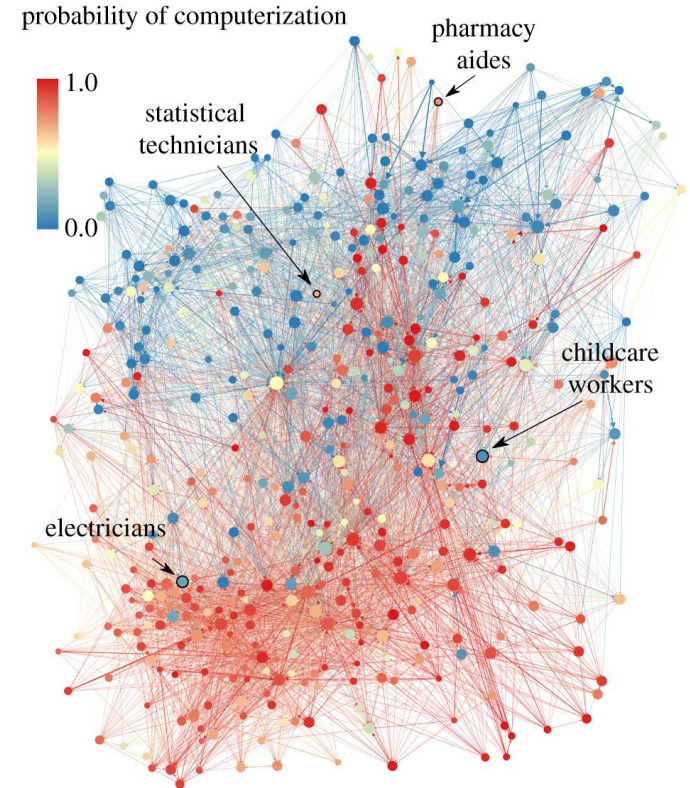
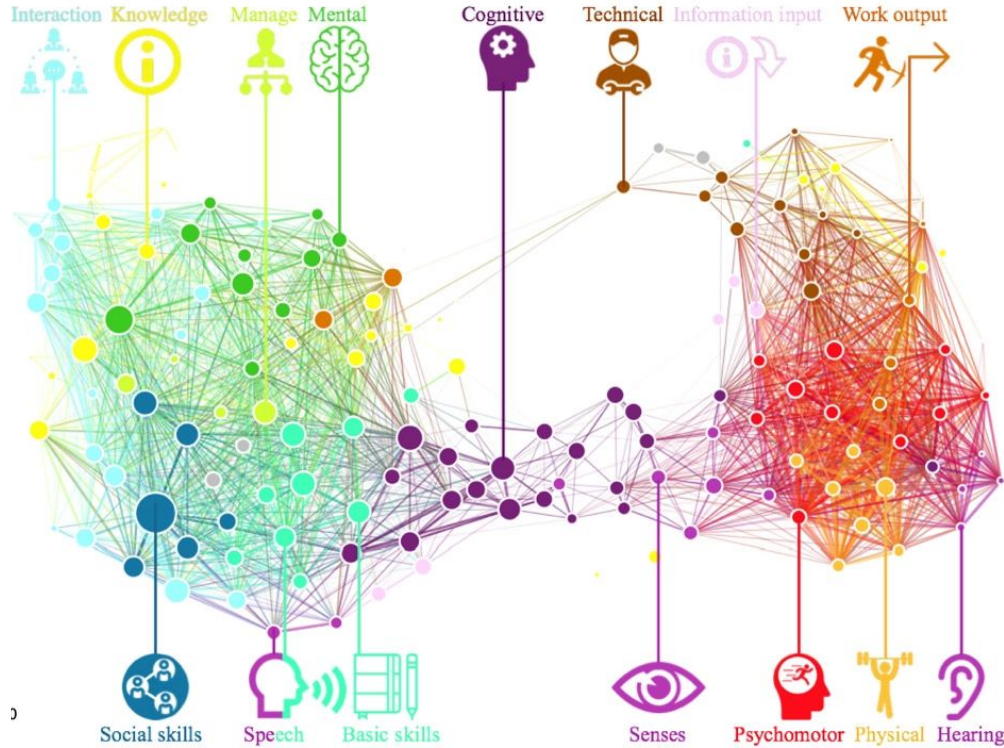
Cardillo, et al. (2013)





# In a network, relevance is determined by “strategic positioning”

Cardillo, et al. (2013)



# References

- Acemoglu, D., & Autor, D. (2011). Skills, tasks and technologies: Implications for employment and earnings. In Handbook of labor economics (Vol. 4, pp. 1043-1171). Elsevier.
- Autor, D. (2015). Why are there still so many jobs? The history and future of workplace automation. *Journal of economic perspectives* 29, no. 3, 3-30.
- Baldwin, R., & Forslid, R. (2020). *Globotics and development: When manufacturing is jobless and services are tradable* (No. w26731). National Bureau of Economic Research.
- Brynjolfsson, E., & McAfee, A. (2014). The second machine age: Work, progress, and prosperity in a time of brilliant technologies. WW Norton & Company.
- Frey, C. B., & Osborne, M. A. (2017). The future of employment: How susceptible are jobs to computerisation?. Technological forecasting and social change, 114, 254-280.
- Stephany, F. (2021). One size does not fit all: Constructing complementary digital reskilling strategies using online labour market data. *Big Data & Society*, 8(1)
- Stephany, F., & Luckin, R. (2022). *Is the workforce ready for the jobs of the future? Data-informed skills and training foresight*. Bruegel.
- Stephany, Fabian and Teutloff, Ole and Lehdonvirta, Vili, What is the Price of a Skill? Understanding the Role of Complementarity (September 30, 2022). <http://dx.doi.org/10.2139/ssrn.4234078>
- Cardillo, A., Zanin, M., Gómez-Gardenes, J., Romance, M., García del Amo, A. J., & Boccaletti, S. (2013). Modeling the multi-layer nature of the European Air Transport Network: Resilience and passengers re-scheduling under random failures. *The European Physical Journal Special Topics*, 215(1), 23-33.