Visualizing Skill Discrepancies Between Research, Education, and Jobs

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Maps of Science & Technology
http://scimaps.org

100 maps and 12 macroscopes by 215 experts on display at 354 venues in 28 countries.
Places & Spaces: Mapping Science Exhibit

1st Decade (2005-2014)
Maps

2nd Decade (2015-2024)
Macroscopes

3rd Decade (2015-2034)
IoT Data & AI Models

http://scimaps.org
The Structure of Science

We are all familiar with traditional maps that show the relationships between countries, provinces, regions, and cities. Similar relationships exist between the various disciplines and research topics in science. This allows us to map the structure of science.

One of the first maps of science was developed at the Institute for Scientific Information over 30 years ago, to identify the 100 areas of science from the citation patterns in 17,000 scientific papers. That early map was intriguing, but didn’t reveal enough of science to accurately define its structure.

Things are different today. We have continuous computing power and advanced visualization software that can make sense of the structure of science possible. This science map of science (left) was generated at Santa Fe National Laboratory using an advanced graph theory model (Yield) from the dataset provided by Web of Science. It was published in 2001. This is the science map that represents one of the 92,000 research communities active in science in 2002, a research community in a species of projects too numerous that are active on the same research topic for a few years. Over time, communities evolve, transform, split, merge, or die.

The map of science can be used as an educational tool for children, the theoretical relationship between areas of science and technology with a connect-as-map showing how much physics, chemistry, biology, and social studies intersect. For advanced students, areas of interest can be located and neighboring areas can be explored.

Nanotechnology

Most research communities in nanotechnology are concentrated in Physics, Chemistry, and Molecular Sciences. However, many disciplines in the Life and Medical Sciences also have nanotechnology applications.

Proteomics

Research communities in proteomics are concentrated in Biophysics. In addition, there is a heavy focus on the trans network, suggesting that the proteome is an important area of study.

The balance of the proteomics community is newly composed among the Life and Medical Sciences.

Pharmacogenomics

Pharmacogenomics is a relatively new field with a lot of activity in Medicine. It also has many connections in the Life and Medical Sciences.
This visualization explores the activity of science, math, and technology (SMT) related articles in the English language Wikipedia (http://en.wikipedia.org). The central image shows 656,884 articles (nodes). Overlaid is a 37 x 37 grid of redoubt half-marks and images. Black, green, and yellow circles represent the 3,099 math, 6,434 science, and 3,167 technology-related articles respectively. The larger the size of a circle the higher the likelihood it is that type of article. The four corners show activity patterns of SMT articles.


http://scimaps.org
A Topic Map of NIH Grants 2007

Bruce W. Herr II (Chalklabs & IU), Gully Burns (ISII), David Newman (UCI), Edmund Talley (NIH)

The National Institutes of Health (NIH) is organized as a multitude of Institutes and Centers whose missions are primarily focused on distinct diseases. However, disease etiologies and therapies fluid scientific boundaries, and thus there is tremendous overlap in the kinds of research funded by each Institute. This creates a daunting landscape for decisions on research directions, funding allocations, and policy formulations. Shown here is devised an interactive topic map for navigating this landscape, online at www.scimaps.org.

Institute abbreviations can be found at www.nih.gov/indic.

Topic modeling, a statistical technique that automatically learns semantic categories, was applied to assess projects in terms used by researchers to describe their work, without the biases of keywords or subject headings. Grant similarities were derived from their topic mixtures, and grants were then clustered on a two-dimensional map using a force-directed simulated annealing algorithm. This analysis creates an interactive environment for assessing grant relevance to research categories and to NIH Institutes in which grants are localized.

Cardiac Diseases Research
As an area of the most focused cardiovascular function and dysfunction, Cardiac Failure primarily funded by NHLBI (usually clustered next to Stroke (NINDS), since these are the two major medical emergencies associated with ischemia, which results from a severe/acute blood supply). Also localized in this area are grants focused on NHLBI's Cholesterol (VLDL) Signaling, a major biochemical pathway for nanomolecules, and grants on Nanomedicine, Stroke, Heart Disease, and Myocardium.

Neural Circuits Research
An area of the most focused neural circuits, which shows the diversity of topics and NIH Institutes that fund research in this area, such as Cardiac regulatory, primarily funded by NHLBI, Visual Processing primarily funded by NEI, and Epilepsy primarily funded by NINDS. For color coding, see legend in the upper left corner.

http://scimaps.org

National Cancer Institute (NCI)
TOP 10 TOPICS
- Oncology Clinical Trials
- Cancer Treatment
- Cancer Therapy
- Genomics
- Biostatistics
- Cancer Chemotherapy
- Genetics
- Epidemiology
- Pediatrics
- Cancer Screening

National Institute of General Medical Sciences (NIGMS)
TOP 10 TOPICS
- Basic Research
- Drug Development
- Computational Models
- Metabolomics
- Lipidomics
- Epigenetics
- Proteomics
- In Vivo Imaging

National Heart, Lung, and Blood Institute (NHLBI)
TOP 10 TOPICS
- Cardiovascular
- Hematologic
- Genetic Linkage Analysis
- Cardiovascular Disease
- Infectious Disease
- Prevention
- Blood Pressure
- Arthritis/Inflammatory Disease
- Gene Expression
- Lipidomics

National Institute of Mental Health (NIMH)
TOP 10 TOPICS
- Mood Disorders
- Schizophrenia
- Behavioral Intervention Studies
- Mental Health
- Depression
- Cognitive Behavior Therapy
- AIDS Psychiatry
- Genetic Linkage Analysis
- Adolescence
- Childhood
Check out our **Zoom Maps** online!

Visit [scimaps.org](http://scimaps.org) and check out all our maps in stunning detail!
MACROSCOPES FOR INTERACTING WITH SCIENCE

- Earth: Weather on a worldwide scale
- AcademyScope: Exploring the scientific landscape
- Mapping Global Society: Local news from a global perspective
- Charting Culture: 2,600 years of human history in 3 minutes

http://idemo.cns.iu.edu/macroscope-kiosk
THE MEGAREGIONS OF THE US

This is the Roanoke (Raleigh) megaregion.

The News Co-occurrence Globe
An interactive visualization of how countries are mentioned together in the world's news media.

UNITED KINGDOM
cooccurrences in: 2,922%
cooccurrences out: 80%

Mapping Global Society – Kalev Leetaru
Government, academic, and industry leaders discussed challenges and opportunities associated with using big data, visual analytics, and computational models in STI decision-making.

Conference slides, recordings, and report are available via [http://modsti.cns.iu.edu/report](http://modsti.cns.iu.edu/report)
Modeling and Visualizing Science and Technology Developments
National Academy of Sciences Sackler Colloquium, December 4-5, 2017, Irvine, CA

Rankings and the Efficiency of Institutions
H. Eugene Stanley | Albert László Barabási | Lada Adamic | Marta González | Kaye Hubsds Fealing | Brian Uzzi | John V. Lombardi

Higher Education and the Science & Technology Job Market
Katy Börner | Wendy L. Martinez | Michael Richey | William Rouse | Stasa Milojevic | Rob Rubin | David Krakauer

Innovation Diffusion and Technology Adoption
William Rouse | Donna Cox | Jeff Alstott | Ben Shneiderman | Rahul C. Basole | Scott Stern | Cesar Hidalgo

Modeling Needs, Infrastructures, Standards
Paul Trunfio | Sallie Keller | Andrew L. Russell | Guru Madhavan | Azer Bestavros | Jason Owen-Smith

nasonline.org/Sackler-Visualizing-Science
Modeling and Visualizing Science and Technology Developments

December 4-5, 2017; Irvine, CA

Overview

This colloquium was held in Irvine, CA on December 4-5, 2017.

This colloquium brought together researchers and practitioners from multiple disciplines to present, discuss, and advance computational models and visualizations of science and technology (S&T). Existing computational models are being applied by academia, government, and industry to explore questions such as: What jobs will exist in ten years and what career paths lead to success? Which types of institutions will likely be most innovative in the future? How will the higher education cost bubble burst affect these institutions? What funding strategies have the highest return on investment? How will changing demographics, alternative economic growth trajectories, and relationships among nations impact answers to these and other questions? Large-scale datasets (e.g., publications, patents, funding, clinical trials, stock market, social media data) can now be utilized to simulate the structure and evolution of S&T. Advances in computational power have created the possibility of implementing scalable, empirically validated computational models. However, because the databases are massive and multidimensional, both the data and the models tend to exceed human comprehension. How can advances in data visualizations be effectively employed to communicate the data, the models, and the model results to diverse stakeholder groups? Who will be the users of next generation models and visualizations and what decisions will they be addressing.

Videos of the talks are available on the Sackler YouTube Channel

https://www.pnas.org/modeling
Twin-Win Model: A human-centered approach to research success
Ben Shneiderman

Forecasting innovations in science, technology, and education
FROM THE COVER
Katy Börner, William B. Rouse, Paul Truffio, and H. Eugene Stanley
PNAS December 11, 2018 115 (50) 12573-12581; first published December 10, 2018. https://doi.org/10.1073/pnas.1818750115

How science and technology developments impact employment and education
Wendy Martinez

Scientific prize network predicts who pushes the boundaries of science
Yifang Ma and Brian Uzzi

The role of industry-specific, occupation-specific, and location-specific knowledge in the growth and survival of new firms
C. Jara-Figueroa, Bogang Jun, Edward L. Glaeser, and Cesar A. Hidalgo
PNAS December 11, 2018 115 (50) 12646-12653; first published December 10, 2018. https://doi.org/10.1073/pnas.1800475115
Arthur M. Sackler Colloquium on Modeling and Visualizing Science and Technology Developments

- **Skill discrepancies between research, education, and jobs reveal the critical need to supply soft skills for the data economy**
  
  Katy Börner, Olga Scrivner, Mike Gallant, Shutian Ma, Xiaozhong Liu, Keith Chewning, Lingfei Wu, and James A. Evans
  
  PNAS December 11, 2018 115 (50) 12630-12637; first published December 10, 2018. [Link](https://doi.org/10.1073/pnas.1804247115)

- **Changing demographics of scientific careers: The rise of the temporary workforce**
  
  Staša Milojević, Filippo Radicchi, and John P. Walsh
  
  PNAS December 11, 2018 115 (50) 12616-12623; first published December 10, 2018. [Link](https://doi.org/10.1073/pnas.1800478115)

- **The chaperone effect in scientific publishing**
  
  Vedran Sekara, Pierre Deville, Sebastian E. Ahnert, Albert-László Barabási, Roberta Sinatra, and Sune Lehmann
  
  PNAS December 11, 2018 115 (50) 12603-12607; first published December 10, 2018. [Link](https://doi.org/10.1073/pnas.180471115)

- **Modeling research universities: Predicting probable futures of public vs. private and large vs. small research universities**
  
  William B. Rouse, John V. Lombardi, and Diane D. Craig
  
  PNAS December 11, 2018 115 (50) 12582-12589; first published December 10, 2018. [Link](https://doi.org/10.1073/pnas.1807141115)

and more ...
Skill Discrepancies Between Research, Education, and Jobs Reveal the Critical Need to Supply Soft Skills for the Data Economy

- Data and Crosswalks
- MaxMatch for NLP
- Causal Analyses
- Visualizations

Study the **(mis)match** and **temporal dynamics** of S&T progress, education and workforce development options, and job requirements.

**Challenges:**

- Rapid change of STEM knowledge
- Increase in tools, AI
- Social skills (project management, team leadership)
- Increasing team size

*Fig. 1.* The interplay of job market demands, educational course offerings, and progress in S&T as captured in publications. Color-coded mountains (+) and valleys (−) indicate different skill clusters. For example, skills related to Biotechnology might be mentioned frequently in job descriptions and taught in many courses, but they may not be as prevalent in academic publications. In other words, there are papers that mention these skills, but labor demand and commercial activity might be outstripping publication activity in this area. The numbers of jobs, courses, and publications that have skills associated and are used in this study are given on the right.
Biotechnology

Jobs

Courses

Science & Technology
Stakeholders and Insight Needs

- **Students**: What jobs will exist in 1-4 years? What program/learning trajectory is best to get/keep my dream job?

- **Teachers**: What course updates are needed? What balance of timely and timeless knowledge (to get a job vs. learn how to learn) should I teach? How to innovate in teaching and maintain job security or tenure?

- **Universities**: What programs should be created? What is my competition doing? How do I tailor programs to fit local needs?

- **Science Funders**: How can S&T investments improve short- and long-term prosperity? Where will advances in knowledge also yield advances in skills and technology?

- **Employers**: What skills are needed next year and in 5 and 10 years? Which institutions produce the right talent? What skills does my competition list in job advertisements?

- **Economic Developers**: What critical skills are needed to improve business retention, expansion, and recruitment in a region?

What is ROI of my time, money, compassion?
Urgency

• 35% of UK jobs, and 30% in London, are at high risk from automation over the coming 20 years.  
  https://www2.deloitte.com/content/dam/Deloitte/uk/Documents/uk-futures/london-futures-agiletown.pdf

• The aerospace industry and NASA have a disproportionately large percentage of workers aged 50 and older compared to the national average, and up to half of the current workforce will be eligible for retirement within the coming five years. 
  https://www.aiaa.org/uploadedFiles/Issues_and_Advocacy/Education_and_Workforce/Aerospace%20Workforce-%20030112.pdf

• The rise of artificial intelligence will lead to the displacement of millions of blue-collar as well as white-collar jobs in the coming decade. 
Skill Discrepancies Between Research, Education, and Jobs Reveal the Critical Need to Supply Soft Skills for the Data Economy

• Data and Crosswalks
• MaxMatch for NLP
• Causal Analyses
• Visualizations


Skill discrepancies between research, education, and jobs reveal the critical need to supply soft skills for the data economy

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Edited by William B. Irvine, Stevens Institute of Technology, Hoboken, NJ, and accepted by Editorial Board Member Pablo G. Debernardi September 12, 2018 (received for review March 14, 2018)

Rapid research progress in science and technology (S&T) and continuously shifting workforce needs exert pressure on each other and on the educational and training systems that link them. Higher-education institutions aim to equip new generations of students with skills and expertise relevant to workforce participation for decades to come, but their offerings sometimes misalign with commercial needs and new techniques forged at the frontiers of research. Here, we analyze and visualize the dynamic skill (mis-)alignment between academic push, industry pull, and educational offerings, paying special attention to the rapidly emerging areas of data science and data engineering (DS/DE). The visualizations and computational models presented here can help key decision makers understand the evolving structure of skills so that they can craft educational programs that serve workforce needs. Our study uses millions of publications, course syllabi, and job advertisement published between 2010 and 2015. We show how courses mediate between research and jobs. We also discover responsiveness in the academic, educational, and industrial system in how skill demands from industry are as likely to drive skill attention in research as the converse. Finally, we reveal the increasing importance of unique human skills, such as communication, negotiation, and persuasion. These skills are currently underestimated in research and undersupplied through education for the labor market. In an increasingly data-driven economy, the demand for “soft” social skills, like teamwork and communication, increase with greater demand for “hard” technical skills and tools.

This paper results from the Arthur M. Sackler Colloquium of the National Academy of Sciences, “Modelling and Visualizing Science and Technology Development:” Held December 1, 2011, as the National Academies Press of the National Academy of Sciences, and is subject to copyright as stated below.

Science of science | job market | data mining | visualization | market gap analysis

Education has been a critical vehicle of economic growth and social progress throughout the modern era. Higher education has been one of the major conduits for preparing students for the workforce and for improving the economic welfare of a population. For many countries, education is a critical component of economic development and growth. The importance of education is reflected in the rapid expansion of the education sector in many countries, particularly in developing economies. The demand for skilled labor has increased in recent years, driven by advances in technology and globalization. This has led to a growing interest in understanding the skills required for the workforce and the role of education in supplying these skills.
Datasets Used

Job advertisements by Burning Glass posted between Jan 2010-Dec 2016.

Web of Science publications published Jan 2010-Dec 2016.

Course descriptions from the Open Syllabus Project acquired in June 2018 for courses offered in 2010-2016.

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<th>Data Type</th>
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<th>#Records with skills</th>
<th>#Records without skills</th>
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</thead>
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<td>54,733</td>
</tr>
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<td>All Jobs</td>
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<td>DSDE Jobs</td>
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<td>All Publications</td>
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<td>DSDE Publications</td>
<td>1,048,575</td>
<td>807,756</td>
<td>240,819</td>
</tr>
</tbody>
</table>
Fig. 2. Basemap of 13,218 skills. In this map, each dot is a skill, triangles identify skill clusters, and squares represent skill families from the Burning Glass (BG) taxonomy. Labels are given for all skill family nodes and for the largest skill cluster (NA) to indicate placement of relevant subtrees. Additionally, hard and soft skills are overlaid using purple and orange nodes, respectively; node area size coding indicates base 10 log of skill frequency in DS/DE jobs. Skill area computation uses Voronoi tessellation.
Fig. 3. Basemap of 13,218 skills with overlays of skill frequency in jobs, courses, and publications. This figure substantiates the conceptual drawing in Fig. 1 using millions of data records. Jobs skills are plotted in blue, courses are in red, and publications are in green. Node area size coding indicates base 10 log of skills frequency. The top 20 most frequent skills are labeled, and label sizes denote skill frequency.
Fig. 4. Burst of activity in DS/DE skills in jobs and publications. Each burst is rendered as a horizontal bar with a start and an end date; skill term is shown on the left. Skills that burst in jobs are blue; skills bursting in publications are green. Seven skills burst in both datasets during the same years and are shown in gray. HRMS stands for human resources management system, and Maximo is an IBM system for managing physical assets.
Kullback-Leibler divergence

**Fig. 5.** Structural and dynamic differences between skill distributions in jobs, courses, and publications for 2010–2013 and 2014–2016. (A) Poincaré disks comparing the centrality of soft skills (orange) and hard skills (purple) across jobs, courses, and publications. (B) KL divergence matrix for jobs, courses, and publications in 2010–2013 and 2014–2016. (C) The most surprising skills in publications and jobs; $R$ is a scripting language, VTAM refers to the IBM Virtual Telecommunication Access Method application, VS is the integrated development environment Visual Studio, and SAS is a data analytics software.
Fig. 6. Strength of influence mapping. Top 200 most frequent skills in jobs (blue) and in publications (green) plotted on the skills basemap from Fig. 2. Arrows represent skills with significant Granger causality (P value < 0.05). Line thickness and label size indicate skill frequency. The direction and thickness of each arrow indicate the $F$-value strength and direction.
Fig. 7. Multivariate Hawkes Process influence network of DS/DE skills within job advertisements 2010–2016. Each of the 45 nodes represents a top-frequency skill (29 soft and 16 hard skills) with a strong influence edge from/to other skill(s) in job advertisements between 2010 and 2016. Node and label size correspond to the number of times that the skill appeared in a job advertisement. Thickness of the 75 directed edges indicates influence strength.
Fig. 7. Hawkes influence network of DS/DE skills within job advertisements 2010–2016. Each of the 45 nodes represents a top-frequency skill (29 soft and 16 hard skills) with a strong influence edge from/to other skill(s) in job advertisements between 2010 and 2016. Node and label size correspond to the number of times that the skill appeared in a job advertisement. Thickness of the 75 directed edges indicates influence strength.
Results

• Novel cross-walk for mapping publications, course offerings, and job via skills.

• Timing and strength of burst of activity for skills (e.g., Oracle, Customer Service) in publications, course offerings, and job advertisements.

• Uniquely human skills such as communication, negotiation, and complex service provision are currently underexamined in research and undersupplied through education for the labor market in an increasingly automated and AI economy.

• The same pattern manifests in the domain of DS/DE where teamwork and communication skills increase in value with greater demand for data analytics skills and tools.

• Skill demands from industry are as likely to drive skill attention in research as the converse.
Next Steps

Collaborate with Burning Glass and other teams to

• Improve skills taxonomy; extract and characterize hard and soft skills

• Use data to understand and manage skill gaps related to the opioid epidemics

• Perform sample analyses for IU
Exemplary set of IU Data Science courses, ‘Software Engineering’ jobs, and associated skills. Job data was retrieved from LinkedIn and CareerBuilder and course data come from the IU course list. As can be seen, there are many skills (in orange) that are exclusively associated with courses or jobs; however, the skills in the middle interlink courses (in red) to jobs (in blue).
Empower students, teachers, and curriculum committee members to understand and discuss current and desirable student cohorts, key course trajectories, or the (gatekeeper) role that specific courses play. Vertically, courses are arranged into four groups based on the department offering the course. Within each vertical grouping, the nodes are sorted by the total enrollment for the course with highest values on top. Node size encodes number of students enrolled; node color denotes overall GPA for the course.
https://www.burning-glass.com/research-project/skills-gap-different-skills-different-gaps
Next Steps

Collaborate with

• Burning Glass
• Ed2go
• Indeed.com
• credentialengine.org

To add more recent data and provide career advise at US level.
Filter By:

COURSE TYPES
- Fundamentals
- Advanced Career Training

COURSE TOPICS
- Arts and Design (11)
- Business (36)
- Career Online High School (3)
- Computer Applications (42)
- Computer Programming (48)
- Construction and Trades (13)
- Data Science & Artificial Intelligence (1)
- Health and Fitness (34)
- Hospitality (4)
- Information Technology (20)
- Language (1)
- Legal (5)
- Math and Science (1)
- Teacher Professional Development (1)
- Test Prep

Search Results

Search

219 Results

Courses

Introduction to Programming
Take your first steps toward a career as a computer programmer as you master basic programming concepts and get hands-on practice in writing applications containing GUIs, sound, and graphics.
- Starting June 12 | July 17
- 6 Weeks / 24 Course Hours

Intermediate C# Programming
Learn to write Graphical User Interface programs in the C# Programming Language.
- Starting June 12 | July 17
- 6 Weeks / 24 Course Hours

https://www.ed2go.com
Search and compare salaries
Over 500 million points of data

Popular Job Titles

Retail Sales Associate
69,754 salaries reported
$11.64 / hour

Laborer
97,867 salaries reported
$12.47 / hour

Leasing Agent
7,496 salaries reported
$820 / week

Housekeeper
54,189 salaries reported
$11.14 / hour

https://www.indeed.com
An arts education transforms students into critical observers of the world. When students begin to craft images, it helps them discover parts of themselves that have previously gone unexpressed. Our art education major prepares you to teach students of all ages, from preschool through grade 12.

https://credentialfinder.org
A Prototype Skills Map

One old job advert may be of little use. But millions of these adverts can provide a detailed picture of the latest skills needed in hundreds of different occupations.

This simple tool aims to show the potential value in old job adverts. For each occupation the tool provides a Skills Map using millions of UK job adverts.

To get started, enter your job title below and then choose the closest occupation group.

Data Scientist

The closest occupation group is:

Other natural & social science professionals

http://data-viz.nesta.org.uk/skills-map
Which skills are employers asking for?

http://data-viz.nesta.org.uk/skills-map

The left-hand column shows the most frequently occurring skills in job adverts for other natural and social science professionals. The column on the right shows the most common skills for all occupations. ‘Skills’ are defined broadly and include types of knowledge, work activities and abilities. Many of the most common terms relate to inter-personal skills, such as customer service and teamwork. The list also includes several basic competencies, such as writing and problem solving. The rectangle below each skill indicates the average salary range across adverts that mentioned the skill. Drag the red circle down to reveal more skills.
How tech heavy is your job?

http://data-viz.nesta.org.uk/skills-map

For each occupation this chart shows the proportion of adverts that mention at least one software program. Markers that are farther to the right suggest there is a broader demand for tech skills in these occupations, but of course these may be basic or advanced skills. Software programs are mentioned most frequently in adverts for IT professionals, web designers and telecommunications engineers. Amongst the most popular software programs are several Microsoft products. A number of other products, such as Oracle, are used to manage large databases. Their presence reflects the growing importance of data in many occupations.

Most asked-for software programs across all occupations:

- .NET Programming
- ASP
- C++
- Hypertext Preprocessor (PHP)
- jQuery
- Microsoft C#
- Microsoft Excel
- Microsoft Office
- Microsoft Powerpoint
- Microsoft Word
- Oracle
- SAP

Other natural and social science professionals:

- Python
- R
- Apache Hadoop
Which occupations require similar skills to yours? 
http://data-viz.nesta.org.uk/skills-map

Considering a career change? Here are occupations that require similar skills to other natural and social science professionals. Beneath each heading are the most sought-after skills for that occupation. Skills in grey are those which are frequently requested for your own occupation, and therefore you may already possess these skills. Skills in black are new skills that you may need to acquire. Some occupations have few close alternatives, while other occupations share certain basic skills but require very different specialist skills.


Visual Analytics Certificate

Advance your skills in one of the most in demand careers through this six-week (18 CEUs) online course focused on understanding and creating data visualizations that translate complex data into actionable insights.

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Connect with industry professionals and leading researchers.

Evolve Yourself
Gain forever knowledge and skill-up in powerful data visualization tools.

Make a Difference
Embrace data-driven decision-making in your personal and professional life.

https://visanalytics.cns.iu.edu
Tuesday 4 June
17:30 - 18:30
**Data visualisation**

[Amphitheatre]

Katy Börner - Indiana University Bloomington
Lynn Cherry - EMLyon Business School
Cesar Hidalgo - MIT Media Lab
Chair: Juan Mateos Garcia - Nesta

Recent years have seen a boom in interactive data visualisation techniques that are regularly used to inform decision-making, disseminate insights in creative ways and explore complex datasets. These developments should be of interest to EMAEE attendees for three reasons: first, they are an example of digitally enabled innovation that is transforming how we engage with data in academia, industry and the media, and as such an interesting case study of technological and creative evolution. Second, they are an increasingly important format for scientific communication. Third, they are a potentially useful tool to study complex innovation systems and technologies such as AI. This half-plenary will bring together three leading innovators in the use of interactive data visualisation - Katy Börner, César Hidalgo and Lynn Cherry - who will tell us about their work developing interactive data visualisations to understand the economy, build data visualisation literacy and analyse AI data.