# Jianjian Gao

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## Research Interests

Computational social science; Network science; Science of science; Policy innovation and diffusion

## Education

**Sep.2018- Dec. 2022    School of Business and Management, Queen Mary University of London        London**

·PhD in Computational social science
·Research Supervisor: Professor Pietro Panzarasa                E-mail: p.panzarasa@qmul.ac.uk

**Sep.2013- Jun. 2016        Institute of  Engineering Thermophysics, Chinese Academy of Sciences        Beijing**

·Master of Power Engineering **Distributed Generation with Renewable Energy Laboratory**        GPA:84.41/100
·Research Supervisor: Professor Hui Hong                E-mail: honghui@iet.cn
·Honours: Annual Scholarship of Chinese Academy of Sciences (2015); Excellent Student Cadre (2015)

**Sep.2009-Jun.2013  Shandong University (National Key  Project 985 University)                Shandong**

·Bachelor of Thermal Energy and Power Engineering                                GPA:87.91/100
·Honours: Outstanding Graduates Awards of Shandong Province (2013); National Endeavour Scholarship (2012);
Research and Innovation of Advanced Personal (2011); The First Prize Scholarship (2010); Merit student (2010)

## Work Experience

**Jul. 2023-present  University of Virginia   Postdoctoral Research Associate                Charlottesville**

· Mainly carry out research on academic leadership in science of science
· Continue the research in international cooperation and policy innovation and diffusion

**Sep. 2021- Dec. 20222        *Queen Mary University of London*        Teaching Assistant        London**

·**Consumer psychology**. The course is aimed at undergraduates on various theories of consumer psychology ·**Experiments for business and analytics.** This course deals with advanced econometrics and R programming for master's students

**Sep. 2017-Jul. 2018  *Department of Thermal Engineering, Tsinghua University* Research Assistant        Beijing**

·Carry out research on power generation system integrated supercritical water gasification of coal, designing the flow processes and optimising the energy performance of the system

**Aug. 2016- Aug. 2017 *Beijing Petrochemical Engineering Co., LTD.(BPEC)*        Assistant engineer        Beijing**

*BPEC* is a company specialised in engineering design, EPC, etc., in the field of petrochemical, coal-chemical, etc.
·Participate in designing the thermal power station of the light hydrocarbon utilisation project

## Research Experience

**Jul. 2023-present                Research Member                                Charlottesville**

***Research Project:*** *Academic leadership*

**Sep. 2018-Dec. 2022                Research Leader                                London**

***Research Project***：  *A network analysis of the structure and evolution of  international environmental cooperation.*
·Apply the network analysis to longitudinal data on international environmental agreements to better understand the emergence and evolution of global environmental cooperation; Exponential Random Graph (ERG) framework is used to produce the bipartite null models
·Perform community detection to reveal whether there are clusters of countries when coping with environmental issues; the drivers and the outcomes of clusters are also analysed

·Analyse rich-clubs to identify prominent actors and reveal the mesoscopic organisation of the cooperation network ·Use Python to prepare, clean, analyse and visualise data, and construct and analyse networks

**Sep. 2020-present**  **Research Leader**  **London**

*Research Project* ： *Innovation and diffusion of climate change laws*
·Use techniques from network science and econometrics to study the innovation and diffusion of climate change laws, including network inference, panel regression and negative binomial regression
·Analyse bursty behaviours of countries to reveal their innovation patterns
·Use both Python and Stata to perform the analysis

**Sep. 2017-Jul. 2018**  **Research Assistant**  **Beijing**

*Research Project: Power Generation System Integrated Supercritical Water Gasification of Coal*
·National key Research and Development Program
·Carry out research on power generation system integrated supercritical water gasification of coal, design the flow processes and optimise the energy performance of the system

**Oct. 2013-Jun. 2016**  **Research Leader**  **Beijing**

*Research Project: Low and Medium Temperature Solar Power Generation Technology*
·Key Program of National Natural Science Foundation of China
·Utilise Aspen Plus to simulate the Kalina cycle driven by the low-and-medium solar heat
·Adopt the adjustable mirror area parabolic trough collector to enhance the performance of the system

**Jan. 2016-Jun. 2016**  **Research Member**  **Beijing**

·*Research Project: Hybrid Solar Concentrating Photovoltaic/Thermal(CPV/T) System*
·Major Program of National Natural Science Foundation of China
·Utilise waste heat of photovoltaic panels to drive the Kalina cycle and/or absorption refrigeration cycle
·Develop steady-state physical model and analyse the influence of key parameters

**Sep. 2014-Jun. 2015**  **Research Member**  **Beijing**

*Research Project: Low and Medium Temperature Solar Chemical-Looping Combustion CCHP System*
·Key Program of National Natural Science Foundation of China
·Simulate the system using Aspen Plus and calculated the exergy loss of all the components
·Combine with thermal energy storage system and test the heat storage capacity of the oxygen carrier by TGA

**Feb. 2013-Jun. 2013**  **Research Member**  **Shandong**

*Research Project: CO$_2$ capture behaviour of CaCO$_3$/CaO under fluidisation conditions*
·Youth Program of National Natural Science Foundation of China
·Collaborate with Dr. Sun to implement experiments of calcium-based industry waste capturing CO$_2$ in a model circulating fluidised bed, and analyse the influence of key parameters on the reaction rate and conversion rate

## Publications

1. **Jianjian Gao**, Pietro Panzarasa. Regionalisation of international environmental cooperation: Evidence from community structure analysis. 2022. (working paper)

2. **Jianjian Gao**, Pietro Panzarasa. European countries lie in the core of the international environmental cooperation. 2022. (working paper)

3. Carattini, Stefano, Sam Fankhauser, **Jianjian Gao**, Caterina Gennaioli, and Pietro Panzarasa. What does network analysis teach us about international environmental cooperation? Ecological Economics. 2023, 205:107670.

4. Stefano Carattini, Sam Fankhauser, **Jianjian Gao**, Caterina Gennaioli, Pietro Panzarasa. The global network of environmental agreements: a preliminary analysis. Annual Bank Conference on Development Economics 2019, Washington, DC.

5. Hui Hong, **Jianjian Gao,** Wanjun Qu, et al. Thermodynamic analyses of the solar-driven Kalina cycle having a variable concentration ratio . Applied Thermal Engineering. 2017, 126: 997-1005.

6. **Jianjian Gao**, Hui Hong, Jie Sun, et al. Study on the performance of concentrated solar Kalina cycle with variable mirror area parabolic trough collector. Journal of Engineering Thermophysics. 2016, 37(8):1595-1601. (In Chinese)

7. Hao Zhang, Hui Hong, **Jianjian Gao**, et al. Thermodynamic performance of a mid-temperature solar fuel system for cooling, heating and power generation. Applied Thermal Engineering, 2016, 106:1268-1281.

8. Hao Zhang, Hui Hong, **Jianjian Gao**. A mid-temperature solar hybridisation CCHP system with alternative fuel chemical-looping combustion. The 28th International Conference on Efficiency, Cost, Optimisation, Simulation and Environmental Impact. June 30-July 3, 2015, Pau, France.

9. Hui Hong, Jie Sun, **Jianjian Gao**. Wide-range irradiation and without energy storage concentrating solar energy Kalina power generation system and method [P]. Beijing: CN105156285A, 2015.12.16.

10. Jianjian Gao. Study on the performance of concentrated solar Kalina cycle with variable mirror area parabolic trough collector [D]. University of Chinese Academy (Institute of Engineering Thermophysics), 2016.

## Presentations

1. **Jianjian Gao**. How climate change laws diffused globally? A network analysis. SBM Phd poster event. Jun 16, 2021, London, UK (Poster).

2. **Jianjian Gao**, Caterina Gennaioli, Pietro Panzarasa. Communities and rich clubs in the international environmental cooperation network. International School and Conference on Network Science, NetSci, Sep 17-25, 2020, Roma, Italy (Poster).

3. **Jianjian Gao**, Caterina Gennaioli, Pietro Panzarasa. Communities and rich clubs in the international environmental cooperation network. 6th International Conference on Computational Social Science, 2020, MA USA (Poster).

4. **Jianjian Gao**, Stefano Carattini, Sam Fankhauser, Caterina Gennaioli, Pietro Panzarasa. Structure and Evolution of the International Environmental Cooperation Network. 6th International Conference on Computational Social Science, 2020, MA USA (Talk).

5. **Jianjian Gao**, Caterina Gennaioli, Pietro Panzarasa. Structure and evolution of the network of countries signing global environmental treaties. 5th International Conference on Computational Social Science, 2019, Netherlands (Poster).

## Skills

·**Computational skills:** Social network analysis, Advanced econometrics, Statistical inference, Bayesian inference, Machine learning

·**Softwares:** Python, Stata, R, GitHub, Overleaf

·**Computer Certificates:** Network Engineer Certificate (Level 4); Database Engineer certificate (Level 4)

·**Languages:** Chinese Mandarin, English

·***Website on Google Scholar***: https://scholar.google.co.uk/citations?user=5DT1ppQAAAAJ&hl=en