

# RUI (ARUHAN) SHI

Department of Economics, University of Warwick, CV4 7AL, UK

Pronouns: she/her/hers | Email: a.shi@warwick.ac.uk | <https://www.aruhanrui.com> | Cell: +447599993497 (UK)

Curriculum Vitae updated December 2022

## EDUCATION

---

PhD Economics, <b>Warwick University</b> , UK	2019 - 2023 (Expected)
<ul style="list-style-type: none"><li>Thesis: Macroeconomic Modelling and Artificial Intelligence Technologies</li><li>Supervisors: Professor Roger Farmer and Professor Herakles Polemarchakis</li></ul>	
MRes Economics, <b>Warwick University</b> , UK, Distinction	2017 - 2019
<ul style="list-style-type: none"><li>Dissertation: Can Deep Reinforcement Learning Agents Learn Rational Expectation Solutions? an OLG exercise</li></ul>	
MSc Economics, <b>Warwick University</b> , UK, Distinction	2015 - 2016
BA (Hons) Business Finance, <b>Durham University</b> , UK, 1 <sup>st</sup> Class Honours	2012 - 2015

## RESEARCH INTERESTS

---

Primary: Macroeconomics, applied artificial intelligence

Secondary: Forecasting, applied econometrics, machine learning techniques, climate economics

## WORKING PAPERS

---

**Job Market Paper: Can an AI agent hit a moving target?** [arXiv: 2110.02474](https://arxiv.org/abs/2110.02474) (2021)

Abstract:

I model the belief formation and decision-making processes of economic agents during a monetary policy regime change with a rise in a central bank's inflation target in a general equilibrium framework. I use an AI algorithm (deep deterministic policy gradient) to model the learning and belief formation process. I show that 1. the AI agent is adaptable to structural changes in the environment; 2. AI agents with different levels of exploration react differently to the rise of inflation target, which has welfare implications in the long term and, 3. the AI learning setup allows for agents to have different past experience, which has further implication for agents' decisions facing structural changes.

**Deep Reinforcement Learning: Emerging Trends in Macroeconomics and Future Prospects**

with Tohid Atashbar. *IMF Working Paper No. 2022/259*. (2022)

**Learning to make consumption-saving decisions in an adaptive environment: an AI approach.** [arXiv: 2105.10099](https://arxiv.org/abs/2105.10099) (2022); *CESifo Working Paper No. 9255* (2021)

**Artificial Intelligence in a Monetary Model** with Mingli Chen, Andreas Joseph, Michael Kumhof, Xinlei Pan, Xuan Zhou. *Rebuilding Macroeconomics Working Paper Series No.58* (2021)

## WORK IN PROGRESS

---

**AI and Macroeconomics Modelling: Deep Reinforcement Learning in an RBC Model**

with Tohid Atashbar (draft working paper available upon request)

**Forecasting with a deep reinforcement learning algorithm**

**Can learning explain different macro aggregate dynamics between advanced and emerging economies?**

## TEACHING EXPERIENCE

---

City University, London	2020
<ul style="list-style-type: none"><li>Financial Economics (third-year undergraduate module, module leader Spyros Galanis)</li><li>Intermediate Econometrics (second-year undergraduate module)</li></ul>	

## PROFESSIONAL EXPERIENCE

---

<b>International Monetary Fund (IMF)</b> , Washington DC	2022
Fund Internship, Strategy Policy & Review Department Macro Policy	
<b>Asian Development Bank (ADB)</b>	2021 - 2022
Consulting Economist, Central and West Asia Department	
<b>Bank of England</b> , London, Academic Visitor	2020
<b>The National Institute of Economics and Social Research (NIESR)</b>	2019
London, Research Assistant	
<b>Warwick University</b> , Coventry, Research Assistant	2018
<b>UNESCO</b> , Paris, Internship	2016 - 2017

## SCHOLARSHIPS, AWARDS AND FUNDINGS

---

Warwick University, full scholarship and tuition waiver	2018 - 2023
<a href="#">NIESR grant</a> for “Deep Learning in a New Keynesian Model of Banking and Money Creation”, PI: Mingli Chen	2019 - 2020
Placed 1 <sup>st</sup> in the economics category of the 2015 Undergraduate Award, fully funded trip to Dublin	2015

## INVITED CONFERENCE PRESENTATIONS

---

Barcelona School of Economics (BSE) PhD Workshop on Expectations in Macroeconomics	2022
The Society for Computational Economics (SCE) 28 <sup>th</sup> International Conference	2022
The Chinese Economist Society (CES) Annual Conference	2022
Bank of England advanced analytics: new methods and applications for macroeconomic policy	2021
MMF Annual Conference	2021
CESifo Area Conference on Macro, Money, and International Finance	2021
International Economic Association (IEA) World Congress	2021
The Society for Computational Economics (SCE) 27 <sup>th</sup> International Conference	2021
The Chinese Economist Society (CES) Annual Conference	2021

## SUMMER SCHOOLS AND TRAININGS

---

Public Debt Dynamics under Uncertainty, IMFx - DDUx, online course	2021
Recent Advances in Bayesian Macroeconometrics by Professor Frank Schorfheide, Foundation of the Swiss National Bank, Gerzensee, Switzerland	2019
Tools for Macroeconomists: The Essential Techniques and Methods to Solve Nonlinear DSGE Models by the London School of Economics and Political Science (LSE), Summer School, London, UK	2018
Econometric Analysis of Network Data by Professor Bryan Graham, Econometrics Summer Masterclass and Workshop, University of Warwick, UK	2018

## ADDITIONAL SKILLS

---

**Programming languages:** Python, and R

**Software packages and platforms:** Matlab; Stata; EViews; PcGive; Dynare; Microsoft Office Suite: Word, Excel, and PowerPoint; Bloomberg terminals; LaTeX

**Languages:** English (fluent), Mandarin (fluent), Mongolian (basic), Japanese (basic) and French (basic)

## SERVICE AND MEMBERSHIPS

---

Co-founder of Asian Women in Macro	2021 - Present
Co-organiser of the annual <a href="#">Warwick Economics PhD Conference</a>	2019 -2021
Memberships: American Economic Association, European Economic Association, Royal Economic Society, Society for Computational Economics, The Chinese Economist Society	

## REFERENCES

---

### **Roger Farmer**

University of Warwick  
Department of Economics  
Coventry, CV4 7AL, UK  
+44 (0)24 761 50048  
R.Farmer.1@warwick.ac.uk  
<https://www.rogerfarmer.com>

### **Friederike Mengel**

University of Essex  
Department of Economics  
Colchester CO4 3SQ, UK  
+44 (0)12 068 73417  
fmengel@essex.ac.uk; fr.mengel@gmail.com  
<https://sites.google.com/site/friederikemengel/home>

### **Herakles Polemarchakis**

University of Warwick  
Department of Economics  
Coventry, CV4 7AL, UK  
+44 (0)24 761 50051  
h.polemarchakis@warwick.ac.uk  
<http://www.polemarchakis.org>

### **Stephan Danninger**

Assistant Director  
International Monetary Fund  
Washington, DC 20431 USA  
+1 202 623 4413  
sdanninger@imf.org