

ESSAI-2024  
Self-Governing Multi-Agent Systems  
L5/10: Constitutional Choice

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# Aims and Objectives

- Aims
  - Analyse some of the issues concerning constitutional choice in SGMAS
- Objectives
  - Understand the strengths and limitations of ‘democracy’ as the “political regime of choice” in cyber-physical and socio-technical systems
  - Know how to design systems with ‘democracy’ as primary value (democracy-by-design)



A T H E N S - G R E E C E

- Knowledge management (see L4)
- How to balance majority preference and expert judgement (see L6)
- Tolerance of dissent (see Kurka et al, 2019)
  - How to enable critics to expose inconsistencies between core values and current practices
- Constitutional Choice and the 'dilemma of the rules'
  - On the one hand, sufficiently unrestricted to allow 'freedom of (collective) action; on the other, sufficiently restricted to resist the 'iron law of oligarchy'
  - How to: provide the material conditions for human flourishing; promote free exercise of constitutive human capacities; and sustain desirable conditions of social existence

- Basic Democracy (Ober, 2017): designing institutions for governance to prevent the occurrence (or recurrence) of tyranny
- Liberal democracy: concerns for justice, values, morality, autonomy, rights, etc.
- Claims
  - Is a reasonably stable form of collective self-government by a diverse group of citizens;
  - Can be both legitimate and effective; and
  - Demonstrates the importance of civic education and civic dignity
- Stability requires rules, which themselves must restrict the absolutist tendencies of the collective rulers and degeneration into different political regimes

- Thought experiment addressing a question about social order
  - How a human community can reliably realise the benefits deriving from social coordination and cooperation ...
  - ... without submitting to a ruling oligarchy or an autocratic monarchy
- Stage one: Founding
- Stage two: Agree on the basic rules on participation, legislation, and entrenchment
- Stage three: Concerns the making and enforcing of post-foundation rules

# SimDemopolis and Some Experiments

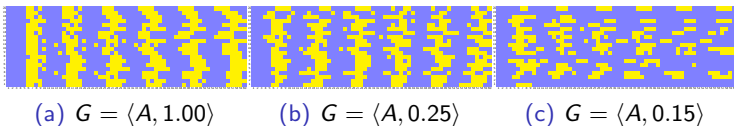
- Multi-agent system
  - Set of agents  $\mathcal{A}$
  - Connected by social network  $\mathcal{G} = \langle \mathcal{A}, p \rangle$
  - Multiple rounds of an *operational choice* ‘game’ – common-pool resource allocation (linear public good game)
  - Occasional invocation of *collective choice* rules – e.g. participation
- Suber’s Game of Nomic
  - Mutable/Immutable rules is helpful
  - So is paradox (paradoxically?)
- Avoidance of (entropic\* tendency to) various forms of tyranny
  - Civic participation (3 variations) vs. oligarchy
  - Legislation/representation vs. autocracy
  - Entrenchment vs. majoritarian tyranny

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\*‘Entropic’ =<sub>def</sub> ‘a process of seemingly inevitable gradual degeneration’

# Civic Participation 1 (Risk of Oligarchy)

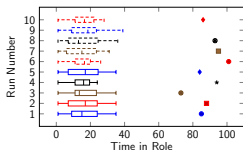
- “All citizens have a duty to share, in one way or another, in making, adjudicating and enforcing the rules”
  - “in one way or another” == “equally”
  - Equal share of the roles computed using the Gini index
- Participation rule involves *opinion formation* and *voting* protocols



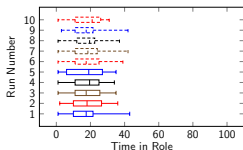
- Observations
  - Quasi-stable (P1/P2)
  - Connectivity supports observations about practice of democratic federalism in classical Athens (P6)

# Civic Participation 2 (Risk of Oligarchy)

- 'Gaming' the participation rule
  - Refusing to accept a role (free riding)  $\rightsquigarrow$  emergence of oligarchic tyranny by default
  - Refusing to resign from a role (power grab)  $\rightsquigarrow$  emergence of oligarchic tyranny by intention
- Citizenship 'tendency'
- Violations resolved with *minor claims* protocols



(d) Without Minor Claims



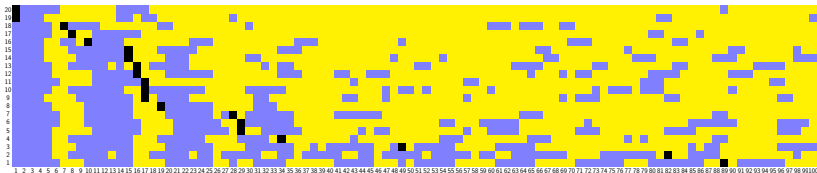
(e) With Minor Claims

- Observations
  - Increased connectivity increases opportunities for misdemeanour (P2) and likelihood of being observed (P5)
  - Limitations of the Gini index; limitations of metrics (P8)



# Civic Participation 3 (Risk of Oligarchy)

- Role assignment bias: most connected node
  - Re-assigns itself to *director* role
  - Appoints a member of its own social network to other roles

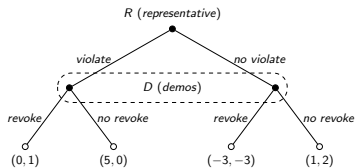


(f) Self-appointing agent

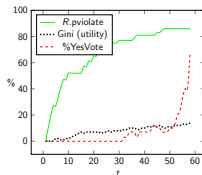
- Observations
  - Requires connectivity of the 'outgroup' to detect (see Interactional Justice)
  - Participation rule alone cannot prevent it, nor cure it (P7)

# Legislation (Risk of Autocracy)

- Legislative processes
  - Enactment and repeal of legislation
  - Transmutation
  - Delegation of political authority from demos to representative



(g) Delegation Game Tree

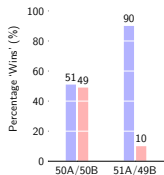


(h) Detection

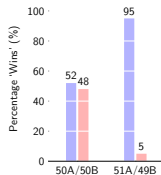
- Observations
  - *Bright lines*: use of immutable rules for the enactment and repeal of mutable rules is restraint on autocratic tendency (P3)
  - *Plug-and-play governance*: reconfiguration of rules at run-time

# Entrenchment (Risk of Majoritarian Tyranny)

- 'MalDemopolis'
  - Assume all agents have a preference for non-tyranny
  - But assume another polarised preference: *TypeA* vs. *TypeB*
- Play partial good game, then play 'elimination' game
  - Citizenship rule has been made a mutable rule



(i) Quorum = 0.6



(j) Quorum = 0.66

- Observations
  - Separation of partial goods issues from citizenship issues (P4)
  - Protection of minority rights and recognition of diversity (P6)

# Some Implications

- Engineering socio-technical systems
- Modelling
- (Historical) Political Science
- Public understanding
- Computational Comparative Politics

- Democracy by Design (DbyD) for Socio-Technical Systems
- DbyD is an instance of value-sensitive design, which recognises that many new socio-technical systems in the digital transformation require some form of collective self-governance
- Eight foundational principles
  - **P1. Prevention rather than re-invention**
  - **P2. Democracy is not an end-state, nor the default**
  - **P3. Seamless transition of power**
  - **P4. No compromises on democratic processes**
  - **P5. Visibility, inclusivity, transparency, and accountability**
  - **P6. Inter-dependence of diversity**
  - **P7. Education in the recognition of prosocial benefits**
  - **P8. Procedural evaluation**

- Theories
  - Make assumptions (e.g. rationality)
  - Make predictions (e.g. Tragedy of the Commons)
- Modelling
  - Socially- (sociologically-) Inspired Computing methodology
  - Build a precise and testable model of a theory of politics
  - Investigate behaviours and trajectories of political systems
- Reflexive Governance
  - Balance tension between
    - Sources of knowledge: public participation versus expertise
    - Composition of public discourse: diversity versus consensus
    - Institutional architecture: polycentricity versus centralization
    - Institutional dynamics: flexibility versus stability

- Documentation of classical processes sufficiently accurate for specification of an algorithm
- Simulation rather than counterfactuals
- Learning and innovation was endogenous

# Public Understanding of Democracy

- Insight into democratic theory and practice
  - Knowledge to resist the slide from populism into extremism
- Reflection: restore collegiate and knowledge-based self-organisation of academia and science, as opposed to centralised, metric-based bureaucratic managerialism
- Protest: public understanding of science and democracy
  - Importance of responsible knowledge management
  - Importance of civic education and critical thinking
  - Importance of civic dignity
  - Distinction between democracy and majoritarian tyranny
  - Identify arrogation of political power and influence



- Comparative politics
  - The study of national politics through examination of political institutions, international politics through the conflicts between countries
- Computational comparative politics
  - The study of political institutions, regimes and processes and their comparative representation in algorithmic form, as a basis for dynamical analysis (e.g. using evolutionary game theory), computer simulation, and systems engineering
  - Specifying algorithms that produce just and sustainable societies, regardless of whether these algorithms are implemented in carbon or silicon

- An Act of Parliament in the Republic of Absurdistan
  - A Minister may by regulations make such provision as the Minister considers appropriate if the Minister considers that such provision should be in force
  - Regulations under this section may not – (a) impose or increase taxation, (b) make retrospective provision, (c) create a relevant criminal offence
  - But regulations under this section may make any provision that could be made by an Act of Parliament (including modifying this Act).

The screenshot shows a web browser displaying the UK legislation.gov.uk website. The page title is "European Union (Withdrawal) Act 2018" and the specific section is "Section 9". The page is titled "European Union (Withdrawal) Act 2018" and "UK Public General Acts > 2018 c. 16 > Main powers in connection... > Section 9". The page is divided into several sections: "Table of Contents", "Content", "Explanatory Notes", and "More Resources". The "Content" section is currently selected, showing the text of Section 9. The text of Section 9 is: "Implementing the withdrawal agreement (1) A Minister of the Crown may by regulations make such provision as the Minister considers appropriate for the purposes of implementing the withdrawal agreement if the Minister considers that such provision should be in force on or before exit day, subject to the prior enactment of a statute by Parliament approving the final terms of withdrawal of the United Kingdom from the EU. (2) Regulations under this section may make any provision that could be made by an Act of Parliament. (3) But regulations under this section may not— (a) impose or increase taxation or fees, (b) make retrospective provision, (c) create a relevant criminal offence, (d) establish a public authority, or (e) amend, repeal or revoke the Human Rights Act 1998 or any subordinate legislation made under it. (4) No regulations may be made under this section after exit day." The page also includes a "What Version" section with "Original (As enacted)" selected, and "Advanced Features" with "Show Explanatory Notes for Sections" checked. The page footer includes "Help", "About Us", "Site Map", "Accessibility", "Contact Us", "Privacy Notice", "Cookies", and "OGL" information.

European Union (Withdrawal) Act 2018

UK Public General Acts > 2018 c. 16 > Main powers in connection... > Section 9

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What Version

- Latest available (Revised)
- Original (As enacted)**

Advanced Features

- Show Explanatory Notes for Sections

Opening Options

More Resources

Status: This is the original version (as it was originally enacted).

**Implementing the withdrawal agreement**

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# Summary and Conclusions

- The fundamental question of political philosophy (Ober)
  - humans evolved the capacity to engage with social construction and political meta-games because it offers our species an effective, efficient and mutually satisfiable way to solve collective action problems that inevitably arise when a group of individuals with different preferences and priorities tries to live together at scale
- Some critical questions
  - Plato: who should rule?
  - Popper: how to dispose of a 'bad' ruler
  - ???: how to marginalise those who will not commit to telling the "truth"?
- Platonic **forms** of self-governance
  - "We had a vote. You lost. That's Democracy. Shut up."
  - **We'd all prefer to live in a 'nice' liberal democracy – but this type of political regime is not the default, is under threat, and needs preserving**
  - *Do not cry tomorrow for that which you did not have the courage and wisdom to defend today – Ariel Dorfman*