



# Lyra: Simulating Believable Opinionated Virtual Characters

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**P O E M**

Principles of  
Expressive Machines

# Opinion Dynamics

- Group formation - social scientists, historians, psychologists etc
- (field) "**Computer Scientists** work to fix easily fooled AI."
- (region) "the **Scottish** voted to overwhelmingly remain in the referendum."

(political ideology) **Democrats** (US), **Tories** (UK)

(fans) **Whovians** (show), **Potterheads** (book), **Beatlemaniacs** (music)

"Individuals relating to a group is an ongoing process of uncertain, fragile, controversial and ever-shifting ties." (Latour 2005, Wesell 2007)

# Opinion Dynamics

- **Computer Scientists, Scottish, Democrats, Whovians**
- Form their own social rules / templates
- Interactions that go against the group's values would be looked upon unfavourably by group members
- Adhere to recognisable social practices and enculturated responses
- Subscribe to sources of information
- Form meaningful connections with group members

# Sample Discussion

- **Object of Discussion:** Discussion on news article *“Room for Debate: Should ‘Birthright Citizenship’ Be Abolished”*
- **Source:** *NY Times (Bias: Leaning Left)*
- **Where:** At work with colleagues
- **Topic:** *Immigration*
- **Duration:** *11 minutes*
- **Number of participants:** *4*

# Sample Discussion

Discussion for 11 minutes on "Room for Debate: Should 'Birthright Citizenship' Be Abolished?"  
 Source: NYTimes  
 Participants: Richard Cain, Ruth Franklin, Vickie Nguyen-Self, Suzanne Sorenson

## Views:

Richard: less uncertain.

Old → att: -0.5 | op: -0.559 | unc: 0.632

New → att: -0.5 | op: -0.559 | unc: 0.554

Vickie: change in views, less uncertain.

Old → att: 1 | op: 0.535 | unc: 0.464

New → att: 0.948 | op: 0.521 | unc: 0.497

Ruth: no change in views.

att: 0.0 | op: -0.063 | unc: 0.225

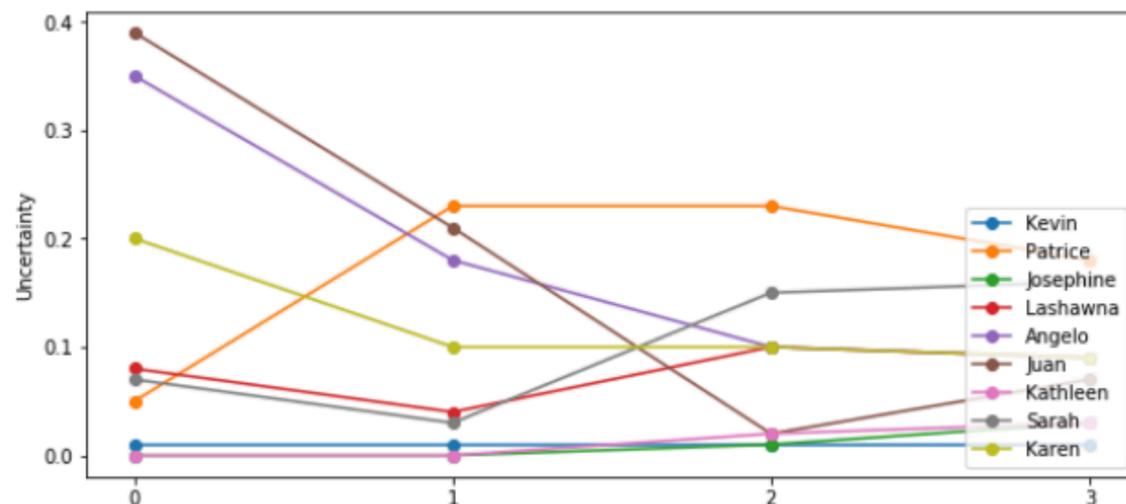
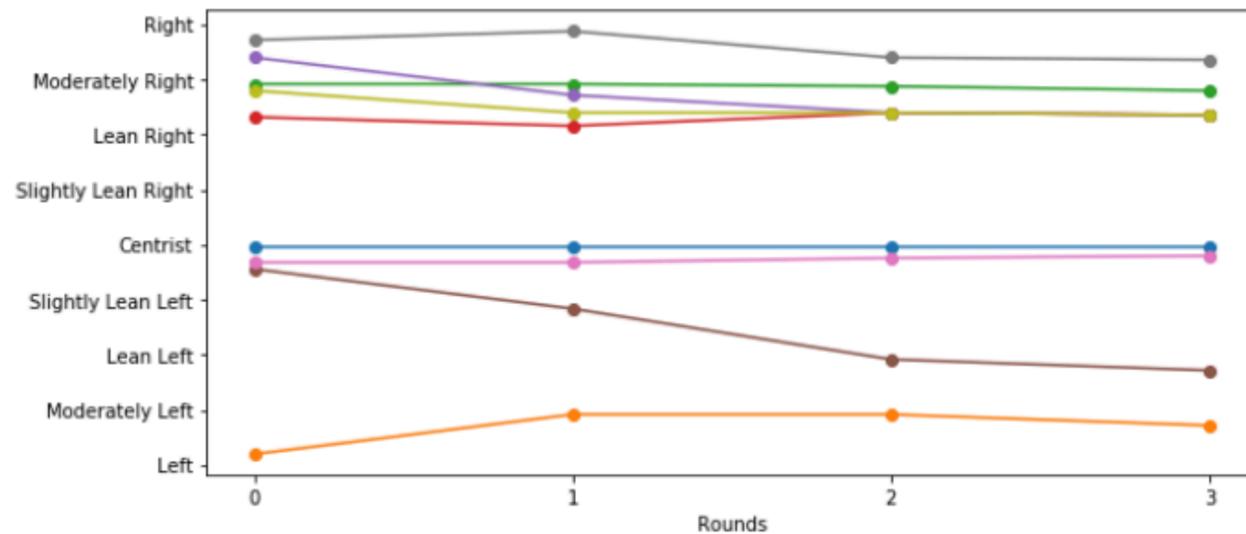
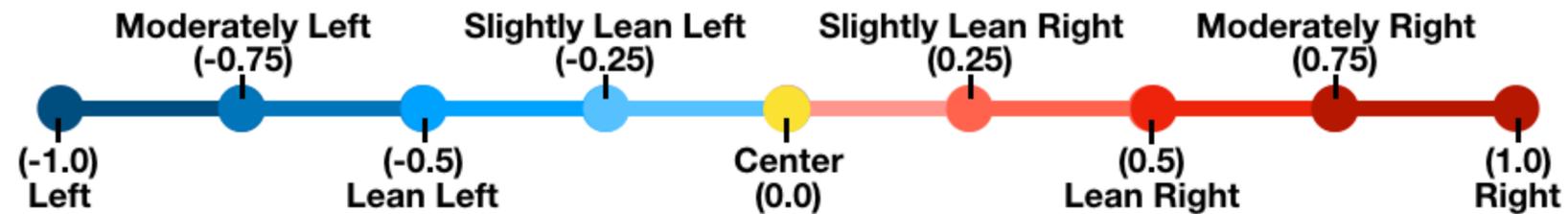
att: 0.0 | op: -0.063 | unc: 0.225

Suzanne: no change in views

att: -0.5 | op: -0.559 | unc: 0.059

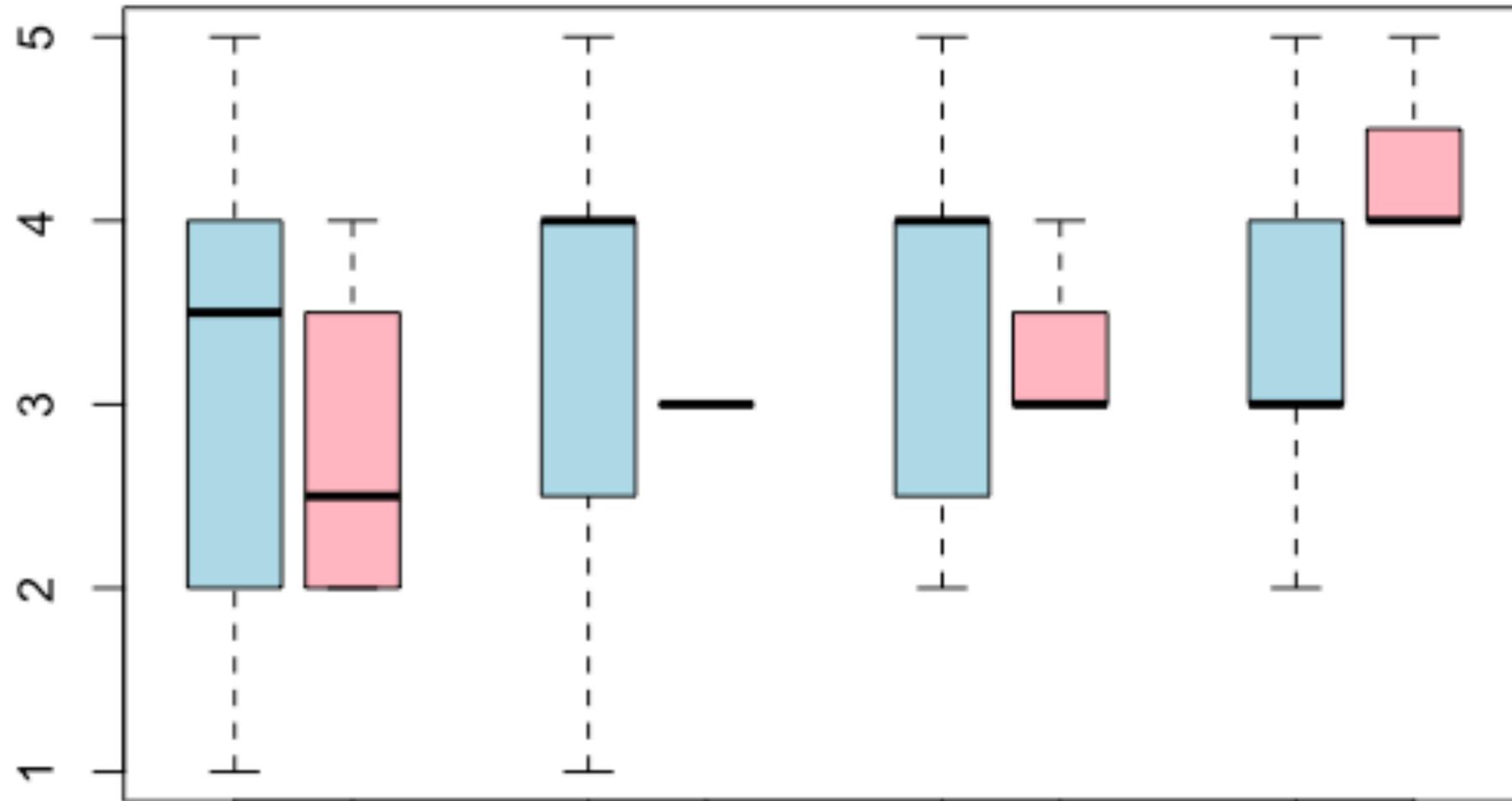
att: -0.5 | op: -0.559 | unc: 0.059

# Designing Simulation Output



Kevin Quinto-Carrillo, Patrice Minnerly, and Karen Harrell decided their respective group's views were insufficient to change their opinions. Juan Vicic was swayed by Patrice Minnerly's argument and decided to change their rating to indicate the same. Kathleen Lawson was swayed by Kevin Quinto-Carrillo and the Article.

# Quantitative Analysis



	<b>Model Agreement</b>	<b>Respondent Agreement</b>
<b>D1</b>	<b>0.1428</b>	<b>0.666</b>
<b>D2</b>	<b>0.5714</b>	<b>0.5714</b>
<b>D3</b>	<b>0</b>	<b>0.238</b>
<b>D4</b>	<b>0</b>	<b>0.333</b>

# Qualitative Analysis

Directed  
Content  
Analysis

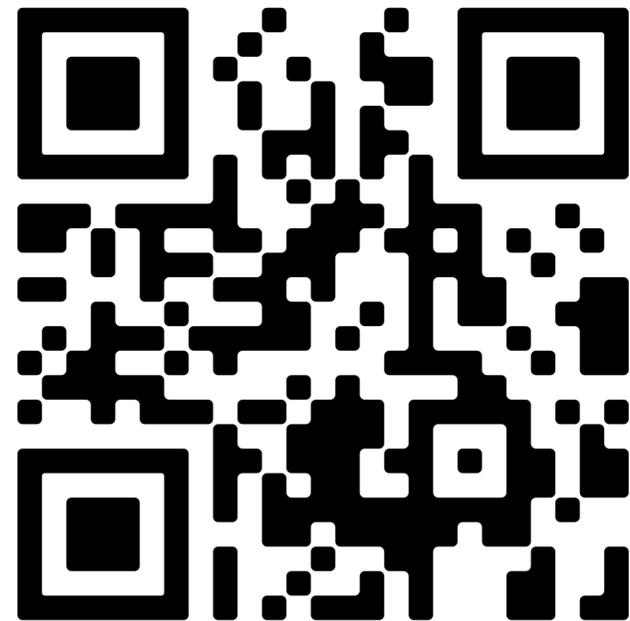
Open/  
Thematic  
Coding

- ▶ Game believability is a critical subcomponent of player experience (Togelius 2013)
  - ▶ Linked to stream of **player emotions triggered by events** during interaction
  - ▶ Linked to **cognitive and behavioural processes incited** during gameplay
- ▶ Characters whose adventures and misfortunes make people laugh and cry... it's what creates the **illusion of life**. (Thomas 1981)
- ▶ **Appearance of human intelligence or human-likeness** adds value to an NPC and to quality of gameplay (Togelius et al. 2013; Champadard 2003; Bateman and Boon 2005)

# Qualitative Analysis

- ▶ "They must support for innovation and reform strongly"
- ▶ "cares about our wellbeing"
- ▶ "Since they moved considerably towards the center; while they started fully left. Changing one's political identity on an issue isn't an easy task and can result in much internal conflict and therefore high uncertainty."
- ▶ "Competitiveness seems to be declining"
- ▶ "Because of the feeling of being marginalised"

**Thank you! Questions? More?  
Come to the poster!**



**See our respondent quotes  
and discovered  
believability measures!**