

Electronic Voting for Participatory Budgeting

Aggelos Kiayias

ROUNDTABLE ON ELECTRONIC VOTING FOR PARTICIPATORY BUDGETING

12 June 2018 | 13:00-16:30 | Appleton Tower Room 8.02, University of Edinburgh

Attendees

Martin Brown, Head of Business Development, Improvement Service

Prof. Peter Buneman, Professor, University of Edinburgh

Prof. Bill Buchanan, Professor of Computing, Edinburgh Napier University

Andrew Campbell, Project Manager, myaccount, Improvement Service

Mike Crockart, Delivery Lead, Online Identity Assurance Team, Scottish Government

Gavin Crosby, Young Scot

Stuart Fraser, Wallet Services

Kathleen Glazik, Community Planning & Community Empowerment Unit, Scottish Govt

Alexander Holt, CivTech Programme Director, Scottish Government

Prof. Aggelos Kiayias, Chair in Cyber Security and Privacy and Director of the Blockchain Technology Laboratory, University of Edinburgh

Rich MacFarlane, Lecturer, School of Computing, Edinburgh Napier University

Dr Bruce Ryan, Research Associate, Centre for Social Informatics, Edinburgh Napier University

Alex Stobart, Mydex Community Interest Company

Liz Ure, Digital Consultant, Elections Team, Scottish Government

Niamh Webster, Digital Democratic Engagement, Democratic Society

Dr Thomas Zacharias, Laboratory for Foundations of Computer Science, University of Edinburgh School of Informatics

Dr Bingsheng Zhang, Lecturer, Lancaster University, Programme Director of M.Sc. Cyber Security



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Panoramix

Agenda

12:30-13:00 Light Lunch

13:00-13:10 Introductions and workshop purpose - Liz Ure

13:10-13:30 Overview of agenda, format and workshop outputs – Aggelos Kiayias

13:30-14:30 Defining the problem – Aggelos Kiayias

What should we be seeking to address? For example:

- ◆ Usability
- ◆ Identity Management
- ◆ Security
- ◆ Cryptography
- ◆ Verifiability
- ◆ Privacy

14:30-15:00 Break

15:00-16:00 What existing solutions do we know about? – Aggelos Kiayias

16:00-16:30 Summary and Next Steps – Liz Ure and Aggelos Kiayias

Participatory Budgeting



Sources of funding

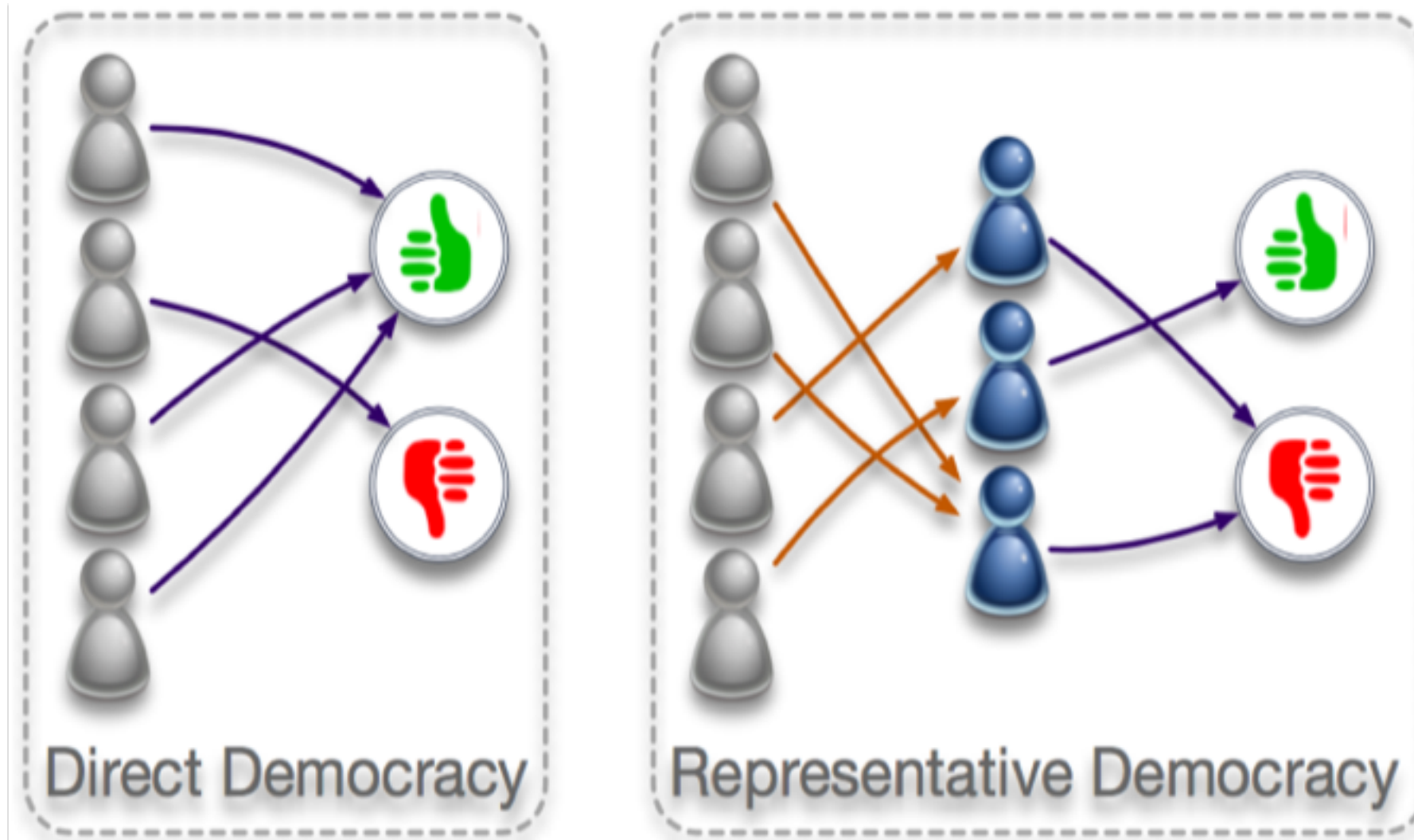
Taxation



Donation



Decision Making in a Democracy



Voters



Representatives



Vote

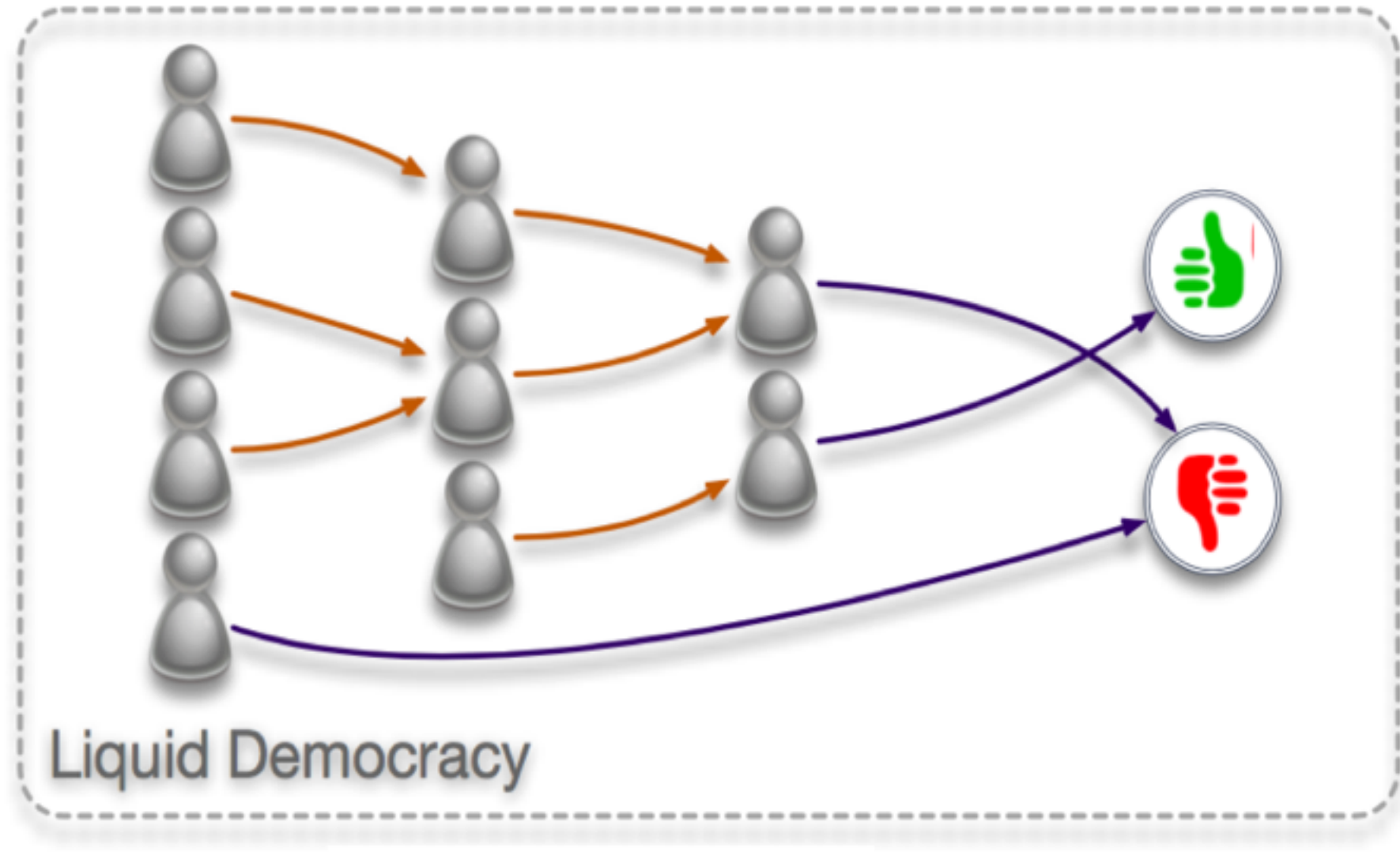


Delegate



Voting options

Liquid Democracy



→ Vote

→ Delegate

Voting Functions:

The challenge of choosing the right function

Voting Functions: Example

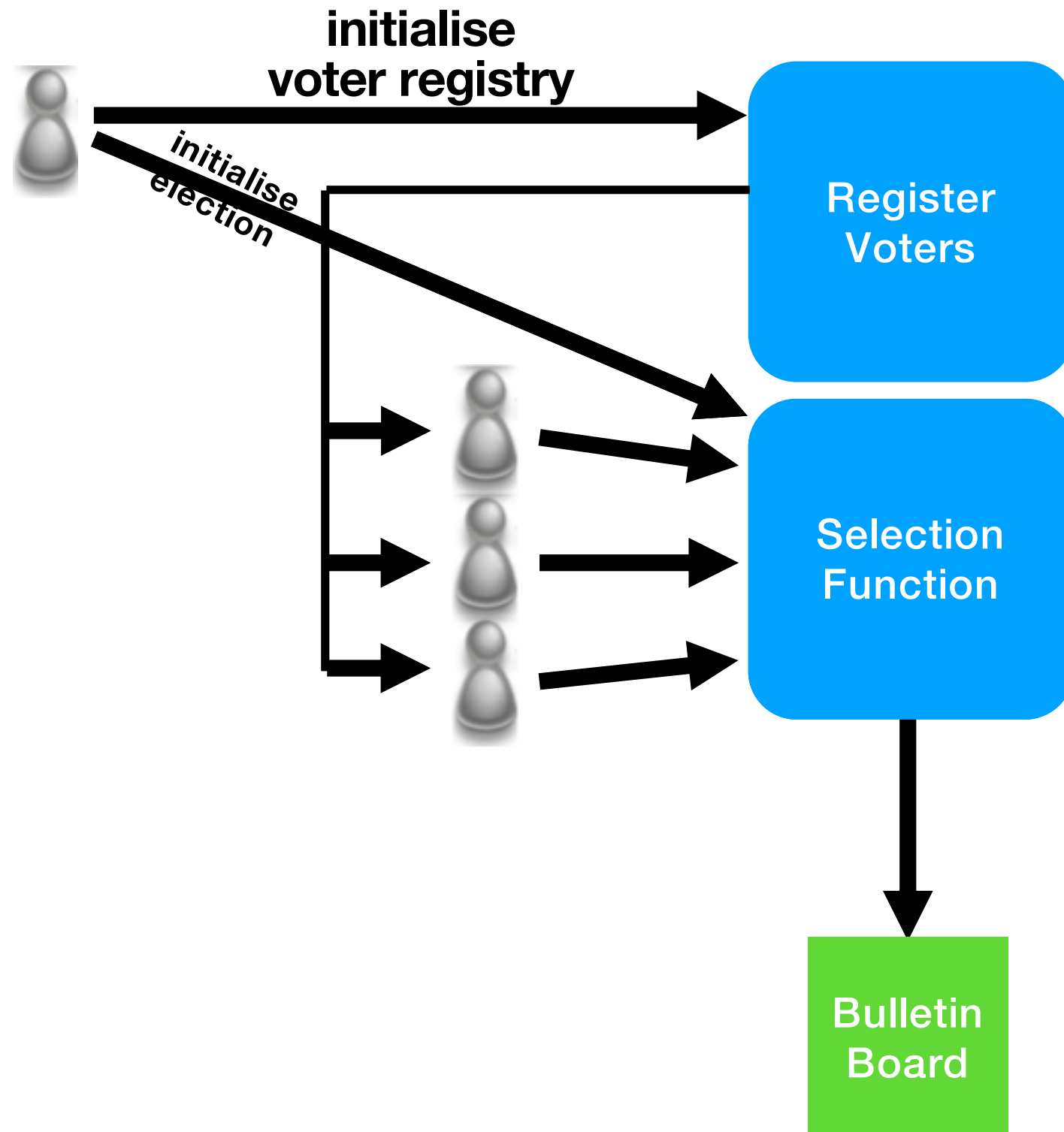
4 voters	3 voters	2 voters
A	B	C
E	C	D
D	E	E
C	D	B
B	A	A

- **Plurality Voting** (candidate with most votes wins): A
- **Plurality Runoff** (two rounds; second round between 2): B
- **Condorcet Voting** (winning all pairwise races, e.g., STV): C
- **Approval Voting** (assign 0,1 based on some threshold): D
- **Borda Count** (assign points 0-4 and sum them): E

Condorcet Paradox.
there is no candidate
that wins pairwise
races.

1 voter	1 voter	1 voter
A	B	C
B	C	A
C	A	B

Objective



Proposed Projects

1. — — £X1

2. — — £X2

3. — — £X3

4. — — £X4

Total budget £Y

Funded Projects.

1. — — £X1

2. — — £X2

Necessary:

$\text{£X1} + \text{£X2} \leq \text{£Y}$