

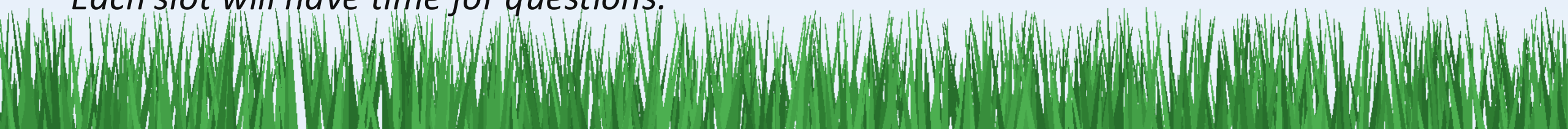
Grassroots Tutorial

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Tutorial Plan

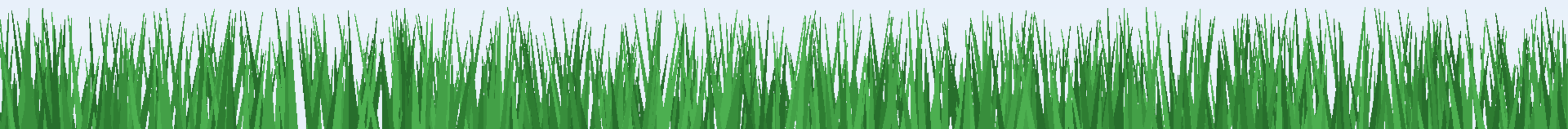
1. Introduction: Grassroots & AI (Udi, 20 min)
2. Bellow consensus: Volitional agents, grassroots social networks and currencies (Andy, 40 min)
--- 30 min coffee break ---
3. Constitutional consensus for democratic governance (Idit, 40 min)
4. Wrap up: How can you help? (Udi, 20 min)

Each slot will have time for questions.



Why Grassroots?

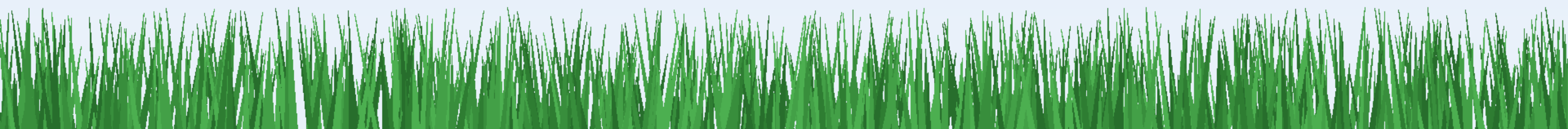
- **1990's Dream:** the Internet will be the great equaliser
- **2020's Reality:** it is the dominant source of inequality
- **Cause:** “Principles of Distributed Computing” of the Internet:
 1. **Centralised:** Facebook/X/Amazon/Uber/... **Autocratic**
 2. **Decentralised:** Bitcoin/Ethereum/... **Plutocratic**
 3. **Egalitarian? Democratic?** Yok/Nada/None... [Scuttlebutt]
- **Grassroots:** An egalitarian and democratic alternative



So what is Grassroots?

Many answers...

1. **Informal** property of distributed systems
2. **Comparison** with global platforms
3. **Formal** property of a formal protocol (Part 2)



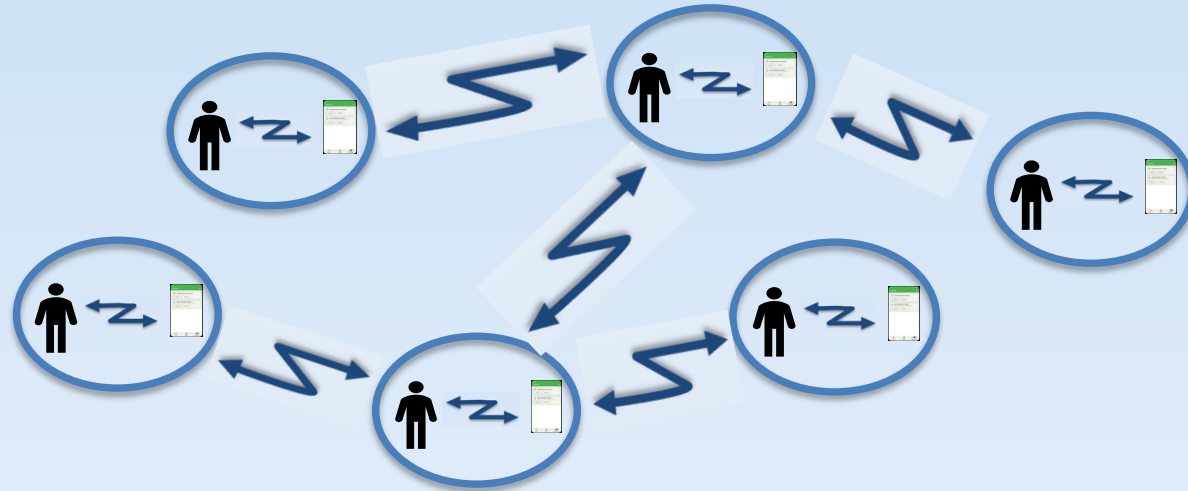
1. Grassroots, informally

“Hardware” platform: people and their smartphones

- Excludes globally-named servers



An Agent



Multi-Agent Grassroots System

1. Grassroots, informally

“Hardware” platform: people and their smartphones

- Excludes globally-named servers

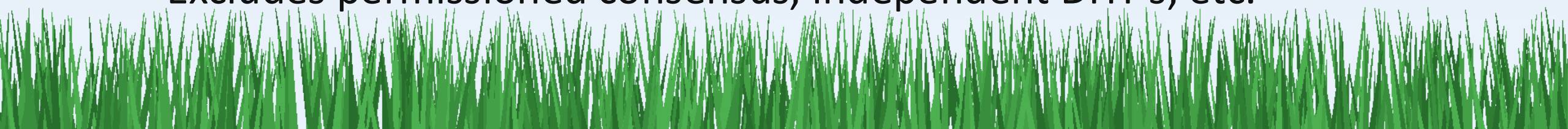
Software platform: (social network, currencies, consensus, etc.)

1. Can have **multiple independent instances**

- Excludes all known centralised (one Facebook) and decentralised (one Bitcoin, DHT, IPFS) systems (but not Scuttlebutt)

2. Instances may **interact and coalesce**

- Excludes permissioned consensus, independent DHT’s, etc.

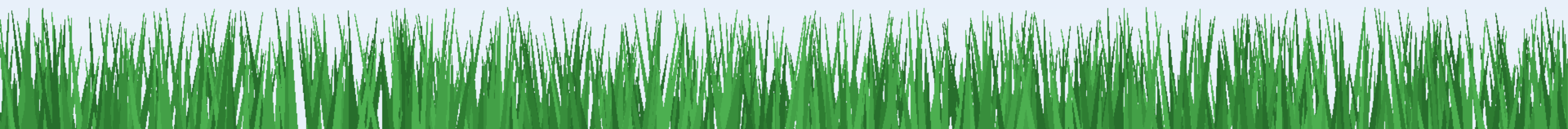


2. Grassroots, by comparison

... of cardinality of essential agents:

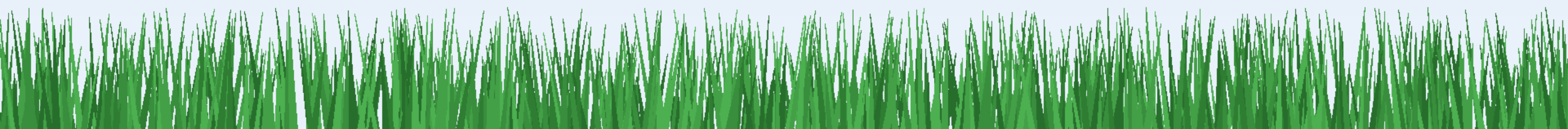
How many agents need to be eliminated to disable communication?

Class	Essential Agents	Cardinality	Canonical Example
Centralised	The server	One	Facebook
Decentralised	Bootstrap nodes	Finite, >1	Bitcoin
Federated	All servers, or all clients	Infinite, but not universal	Mastodon
Grassroots	All (but one 😊)	Universal	Scuttlebutt



3. Grassroots, formally

[In the second part of the tutorial]

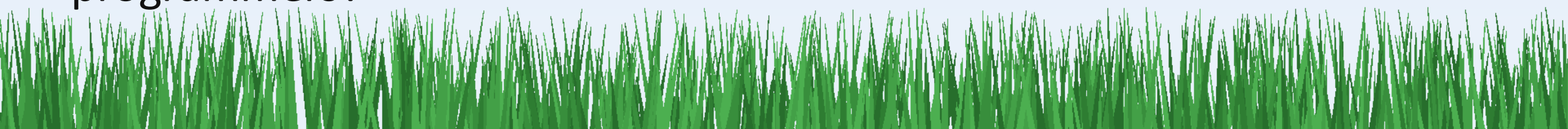


The Grassroots Vision

1. **Grassroots upgrades of** Facebook, X, Bitcoin, Ethereum, Uber, Airbnb, Deliveroo, Amazon Marketplace,...
2. **Novel grassroots platforms for** Child-Safe Social Networking, Digital Cooperatives, Civil Movements, Political Parties, Democratic Communities from local to global.

We already have grassroots specs for many of these... but

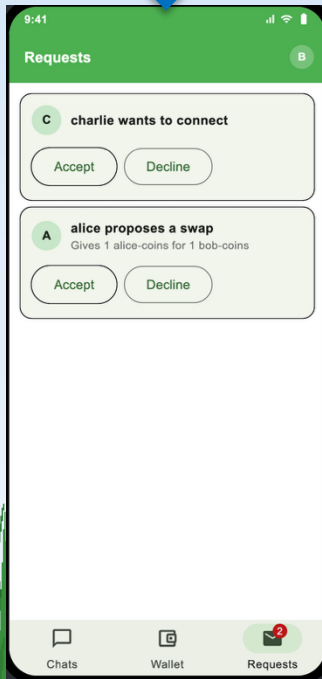
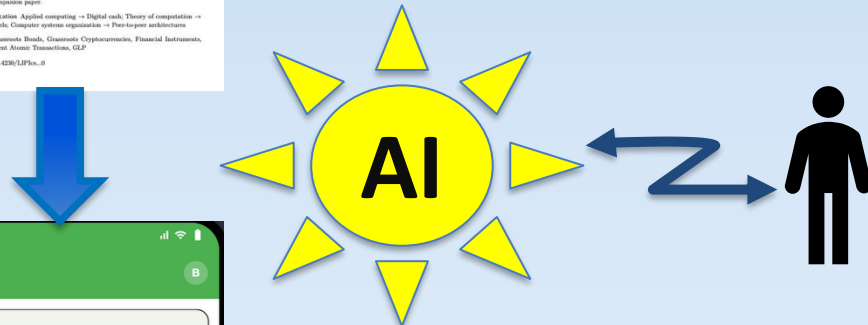
How to square the circle? Get funding and recruit the best programmers to compete with \$100Ms budgets and 100Ks programmers?



Realising the Grassroots Vision with AI



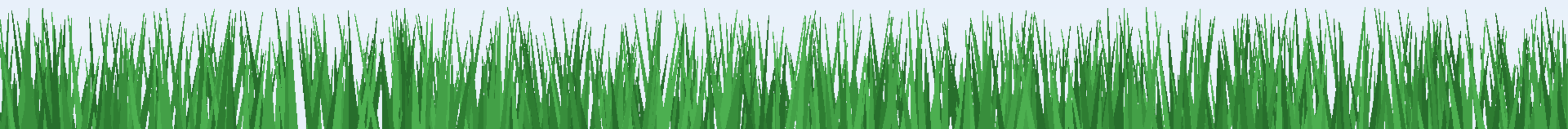
Scientific paper describing a grassroots platform



Smartphone App realizing the grassroots platform

Programming & AI: A Personal History

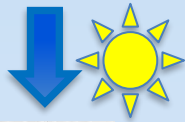
- **1971 FORTRAN in high school:** compile-run cycle — 1 week
- **1977 Cobol in a bank:** compile-run cycle — 24 hours
- **1980 Prolog at Yale:** interactive development of AI — machine learning/program synthesis/algorithmic debugging (IJCAI'81)
- **1982-1995 Concurrent Prolog:** Developed language and social networking app (Virtual Places)



Today: Implementing Grassroots with AI



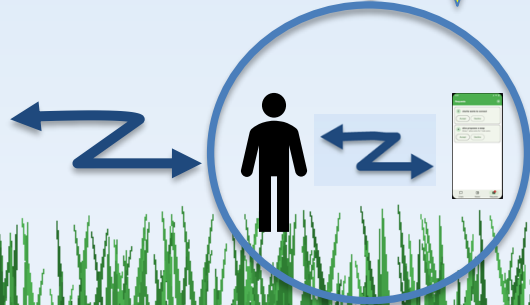
Scientific paper describing a grassroots platform



GLP program realizing the grassroots platform



Dart/Flutter implementation of GLP



Grassroots App on iPhone/Android phones

End of Introduction

Questions?

