**Open Census for addressing False Identity Attacks in Agent-based Decentralized Social Networks**

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**Decentralized Census Problem (DCP)**

- **Identity Verification**
- **Synergy**
- **Census**

**Witninessing: extension to PGP (EPGP)**

Can witness/certify for and against somebody’s qualities.

**Decentralized Census Process**

Generate and disseminate identities & witness stances (EPGP) on qualities like:
- voting eligibility, $\psi$
- reliability in witnessing, $\Phi$

Each user reasons with a Bayesian Network and has her own result.

Statistics of a predicate $f$, (e.g., “has opinion x”):

$$E[[f]] = \sum_{s \in \text{identities}} \Psi(s) f(s)$$

$$E[[\text{census}]] = \sum_{s \in \text{identities}} \Psi(s)$$

Probabilities of quality $\psi$ are inferred from the Bayesian Net of the observer.

**Experimental Results**

Markov Chain Monte Carlo is used in agents from http://DirectDemocracyP2P.net

HAC – Honest Active Constituents

**Bayesian Network for DCP**

For each users A and B, and available witness stances between them, the Belief Network has the subgraph:

**Example DCP**

Observer

Alice

Bob

Carol

Alice: $\Psi$

Bob: $\Psi$

Carol: $\Phi$

**Sample CPT**

For each pair of identities A, B and for each available witness stance, CPTs look as here:

**Scalability: Neighborhoods**

Census is computed separately on each neighborhood

Neighborhoods are organized in a tree hierarchy s.t. everybody can certify his ancestor nodes’s children.