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Modeling Tribal Leadership

An opinion dynamics model of the traditional Pashtun tribal balance of power

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Introduction

- **U.S. Involvement in Afghanistan**
  - 2001-present: At war
  - 1979-1989: Assistance to the Afghan resistance movement
- **Understanding Culture**
  - Very different from Western culture
  - Influences: traditional, tribal, Islamic, Indian, British, Soviet, U.S.
  - Lack of understanding has impacted success in multiple areas: military, social issues, economic stability, development
- **Needs**
  - Understand tribal leadership dynamics
  - Understand the effect of changes on the selection of leaders
  - Foresee the effects of alternate strategies on tribal leadership

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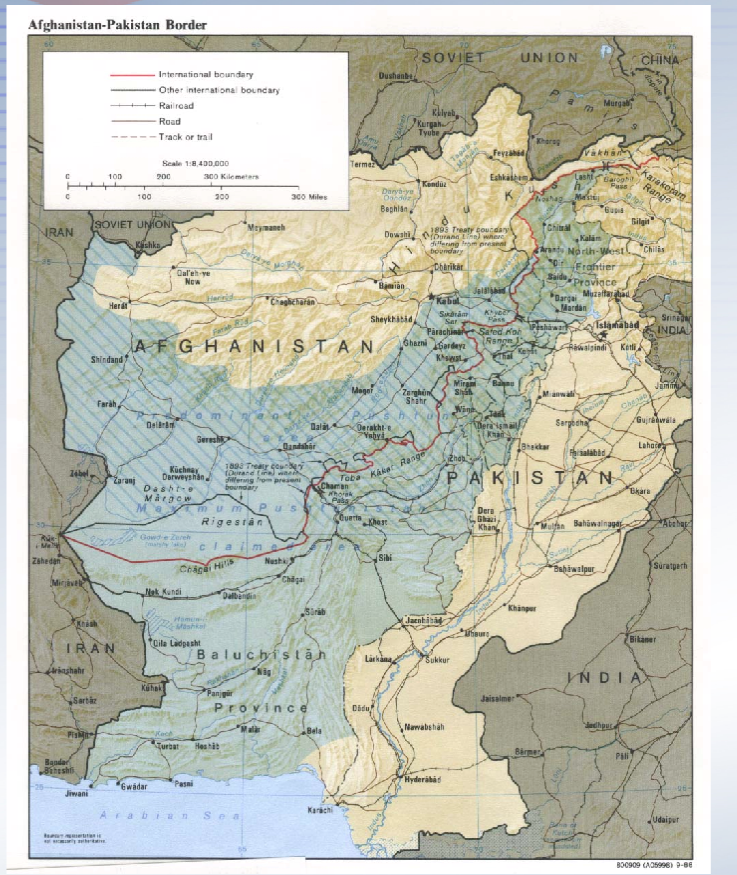
Pashtun Tribal Areas – "Pashtunistan"



- **Pashtun tribe**
  - 42-60% of Afghanistan
  - 15% of Pakistan
  - Speak Pashto – Eastern Iranian language group
  - Practice *Pashtunwali* – dates to pre-Islamic times
- **Durand Line**
  - Established 1893
  - Agreement between colonial British India and Afghanistan
  - Very porous border

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Principles of Tribal Society

- ***Pashtunwali* – way of the Pashtuns**
  - *nang* (honor/bravery)
  - *badal* (justice, revenge)
  - *melmastia* (hospitality)
  - *nanawatai* (asylum)
  - *namus* (honor of women)
- **Egalitarian**
  - All men who own land are equal
  - No ruling class or inherited rule
- **Acephalous**
  - No clearly defined leader or hierarchy
- **Agnatic rivalry**
  - Male first cousins are enemies – rivals for inheritance
- **Constant rivalry among those vying for leadership roles**

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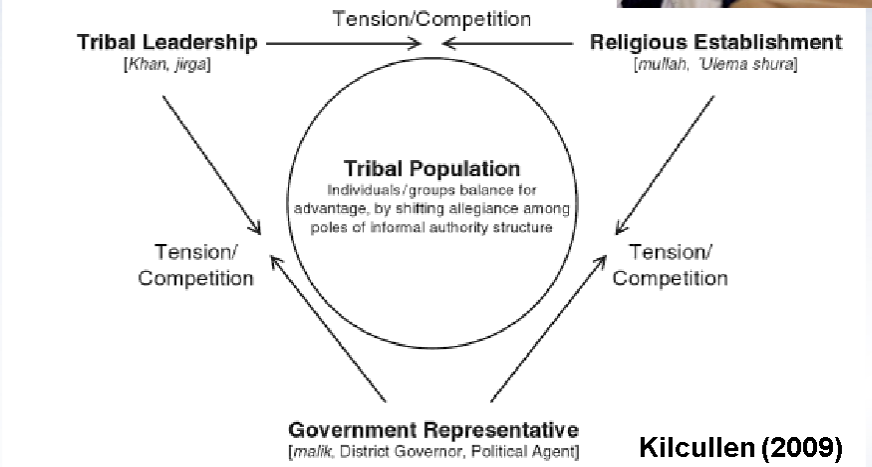
Qualities of Leadership

- **"First among equals"**
  - In keeping with egalitarian society
- **No explicit power to coerce obedience**
  - Must convince the people that his judgment is sound
  - Support can fade away if situation changes
- **Retain power by providing what community needs**
  - Security
  - Prestige
  - Material goods
  - Dispute resolution
- **Helps community to avoid blood feuds**
  - Moving speaker who can convince parties in a dispute to reach a settlement
- **Depends on the opinion of the community**

Pashtun Tribal Governance Triad



Tribal Governance Triad

Kilcullen (2009)

- **Religious leadership**
  - Mullah
  - Ulema shura
- **Secular leadership**
  - Khan
  - Jirga
- **Government representative**
  - Malik
  - District Governor
  - Political Agent

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Hypothesis

- **How to approach the problem?**
- **What we need**
  - Understand tribal leadership dynamics
  - Understand what may trigger a change of leadership
  - Predict the effects of alternate strategies on tribal leadership
- **Research questions**
  - Can we create a model that incorporates the dynamics of Pashtun tribal leadership?
  - Can this model be used to gain understanding about the balance of power between the leaders?
  - Can this model help to gain understanding about the effects of radicalization and other social changes on the leadership balance of power?

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Modeling Methodology

- **Challenges and Limitations**
  - Availability of open source data on tribal leadership
    - No census in Afghanistan since 1975
    - Comprehensive information on tribal leaders not available
    - Records are not kept on leadership succession
  - Dangerous war environment
    - Cannot visit location safely
  - Hostility to outsiders
  - Cultural disruption and change due to events of past three decades
    - Difficult to separate effects of war and disruption
    - Situation results in permanent changes in society depending on level of disruption

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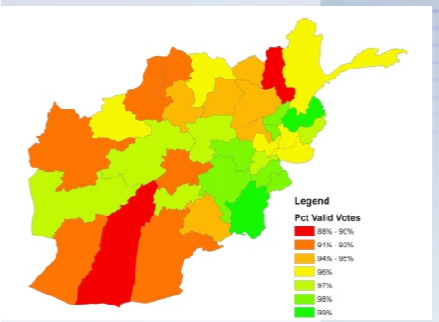
Modeling Methodology



- **Possible methods considered**
  - Case studies; long-term, in-depth study of a limited area
    - Several historical studies – provide qualitative information on historical structure of tribal leadership
    - Not possible at this time to do new case studies due to dangerous environment
  - Surveys
    - Dangerous situation; distrust of outsiders
  - Data analysis and spatial analysis (GIS)
    - Minimal comprehensive data available – little on leaders and leadership
  - Mathematical modeling
    - Lack of data
  - Simulation modeling
    - Good interim solution until data can be collected
    - Data can be integrated as it becomes available

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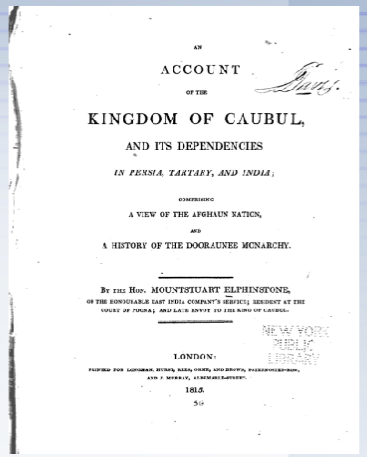
Modeling Methodology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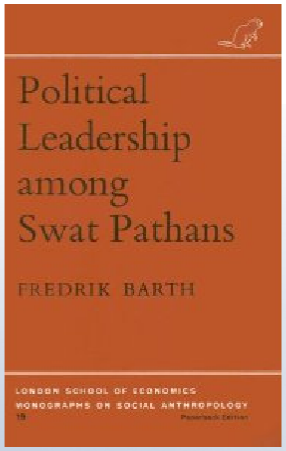
ACCOUNT
OF THE
KINGDOM OF CAUBUL,
AND ITS DEPENDENCIES
IN PERSIA, TARTARY, AND INDIA;
COMPRISING
A VIEW OF THE AFGHAUN NATION,
AND
A HISTORY OF THE DOORAUNEE MONARCHY.
By the Hon. MOUNTSTUART ELPHINSTONE,
LONDON:
1815.

- **Develop a conceptual model of tribal leadership based on existing qualitative information**
  - Historical writings
    - British invasions – Elphinstone (1815), Ridgeway (1918)
  - Anthropological studies
    - Fredrik Barth (1959), Akbar Ahmed (1976), Charles Lindholm (1979)
  - Cultural analyses and military assessments
    - David Kilcullen (2009)
  - News reports
- **Create a simulation model of tribal leadership**
  - Generate data
  - Incorporate dynamics of leadership
  - Study effects of changes on leadership



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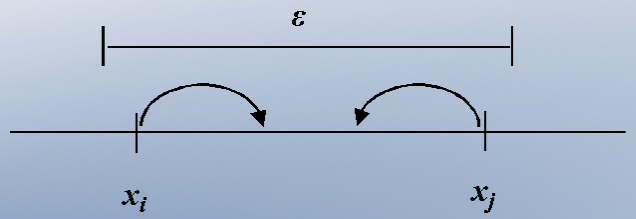
Opinion Dynamics Models

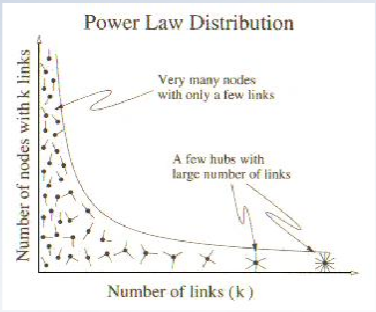
- **Using statistical physics to model social phenomena**
  - Opinions, cultural and linguistic traits, social status, are modeled in terms of a small set of variables whose dynamics are determined by social interaction
  - Aim is understanding the transition from an initial disordered state to a configuration that displays order
  - Topology of the social network defines who interacts with whom
- **Opinion dynamics studies the dynamics of agreement/disagreement among individuals**
  - Aim at defining the opinion states of a population and the processes that determine transitions between such states
  - Opinions form clusters: one (consensus), two (polarization), more (fragmentation)
  - First opinion dynamics model proposed by a physicist in 1971

Bounded Confidence Models

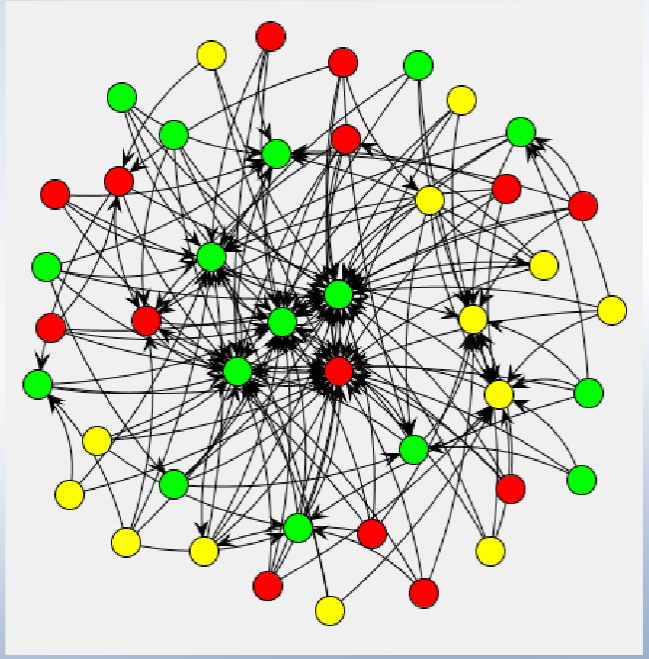
- **Bounded confidence**
  - Opinions are on a continuum – can vary between extremes
  - Real discussion and changes in opinion only occur if the opinions of those involved are sufficiently close to each other
  - Each agent has an uncertainty or tolerance associated which defines their openness to interaction
  - Deffuant et al. (2000, 2002)
- **Agents only interact with neighboring agents whose opinions are not too different from their own**
  - Agent i has opinion x_i and uncertainty ε
  - Agent i will interact with neighbor agents whose opinions are in the range $[x_i - \varepsilon, x_i + \varepsilon]$
  - Agent i and agent j adjust opinions to be closer to neighbor's opinion



Tribal Leadership Model



- **Generate tribal social network**
  - Scale-free network
  - Connections exhibit power law
  - Characteristic of many social networks
  - Barabasi-Albert (1999) graph generation algorithm



- **Nodes represent male tribal members**
- **Edges represent social connections**
- **Direction of connection indicates where an individual looks for guidance**

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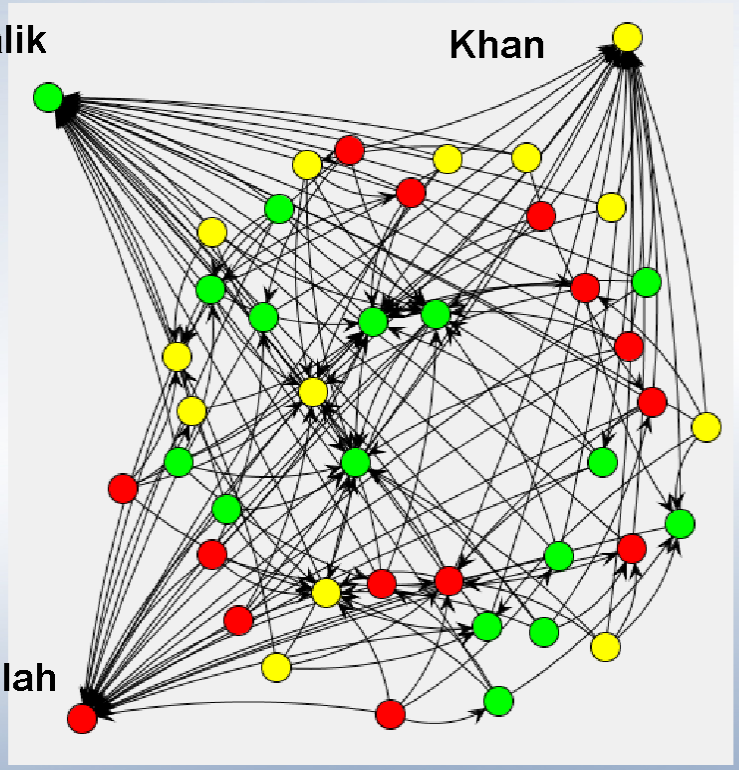
Tribal Leadership Model

- **Three nodes represent three leadership roles**
  - Have more social connections than other nodes
  - Outdegree = 0; these agents only influence others' opinions; their opinions do not change



- **Color indicates leadership preference**
  - Mullah – red
  - Malik – green
  - Khan – yellow

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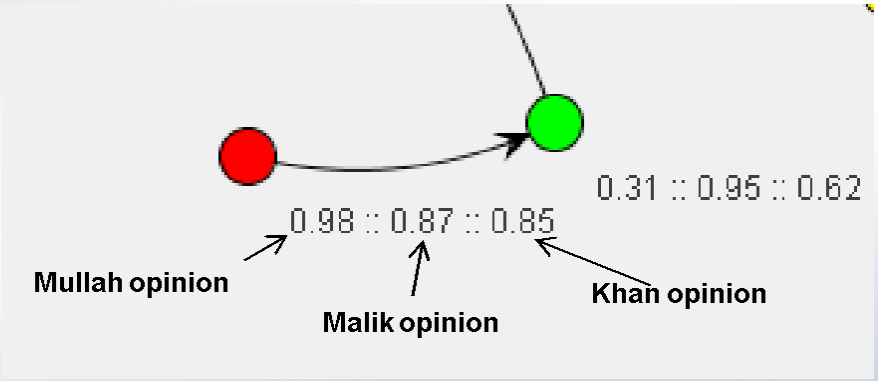
Tribal Leadership Model

- **Opinion assignment**
  - Opinions assigned randomly
  - Each individual holds three opinions – one for each of the three leaders
  - Leadership preference determined by highest opinion



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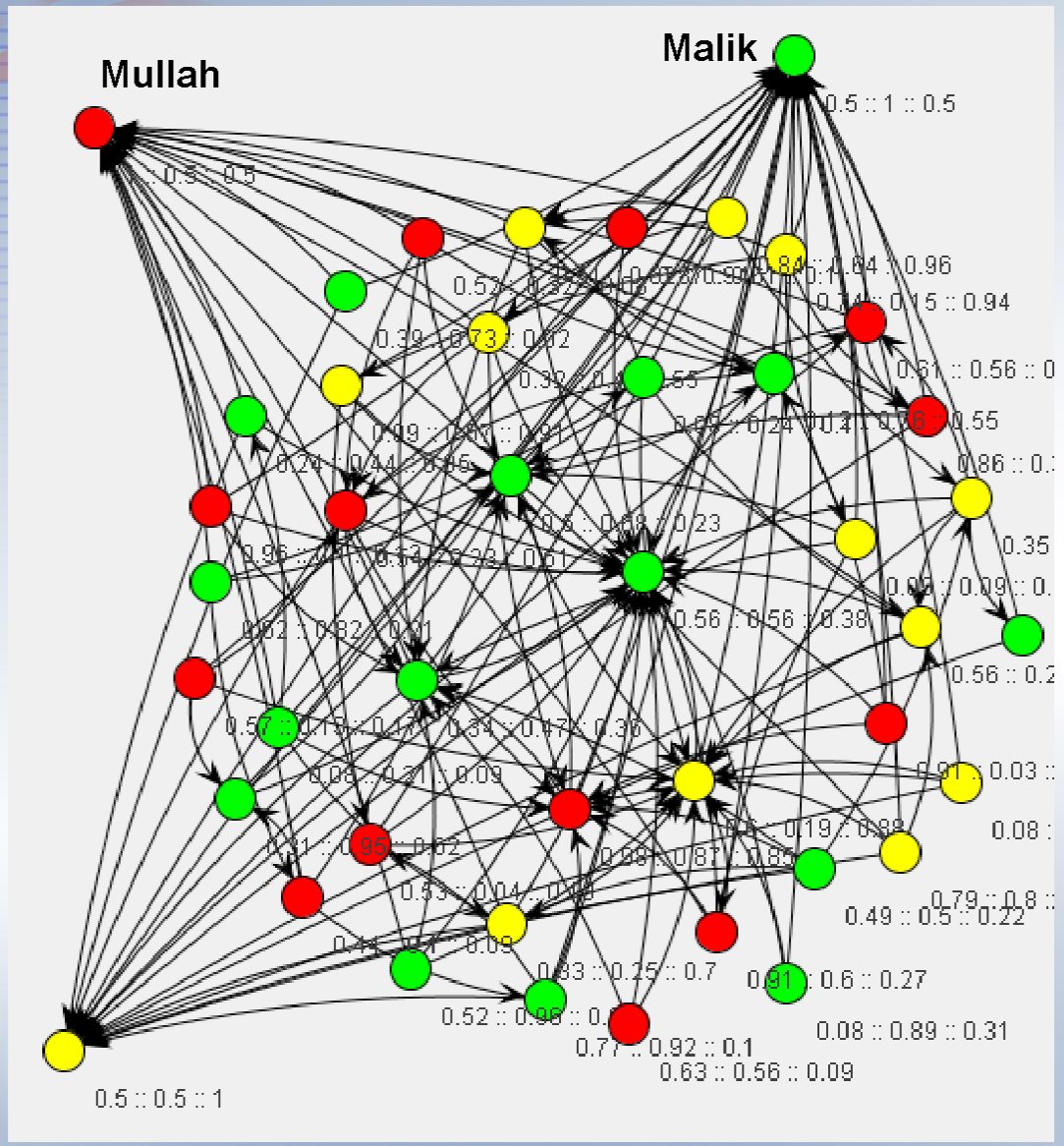
Initial Opinions



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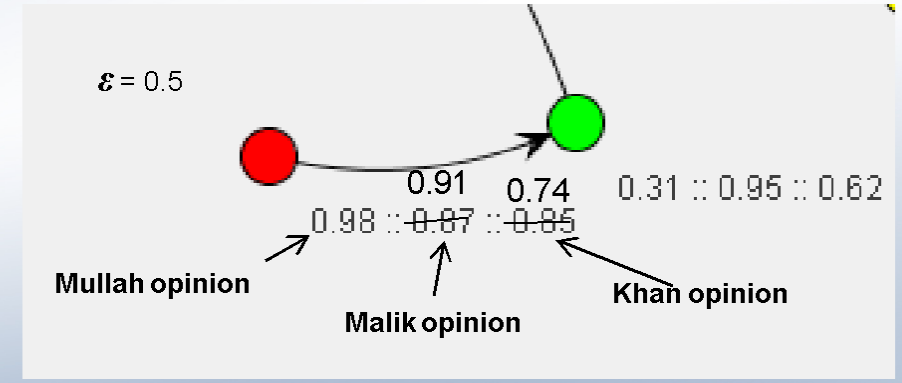
Opinion Modification

- **Agent interaction results in modification of opinions**
  - Value of uncertainty ε determines if opinion changes
  - Mullah opinion: |0.98 – 0.31| = 0.67 – opinion does not change
  - Malik opinion: |0.87 – 0.95| = 0.08
    - Opinion changes to close half of difference
    - New malik opinion is 0.91
  - Khan opinion: |0.85 – 0.62| = 0.23
    - New khan opinion is 0.74



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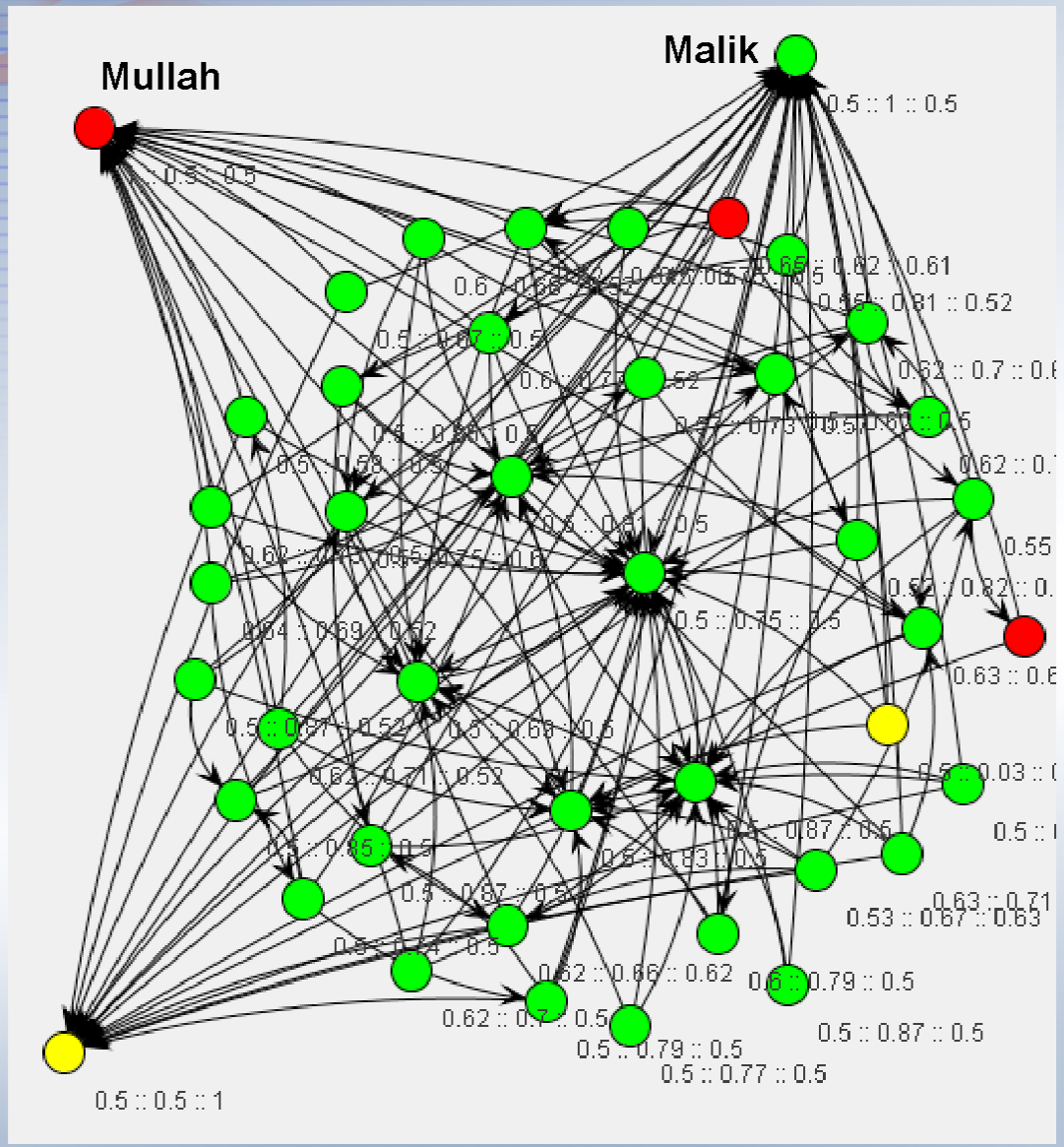
At Equilibrium



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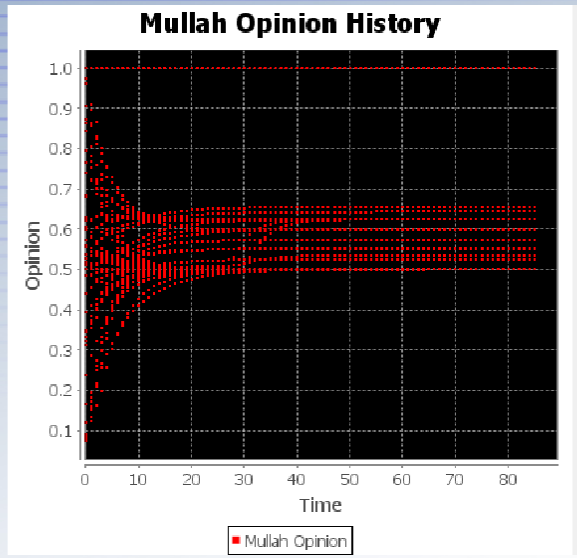
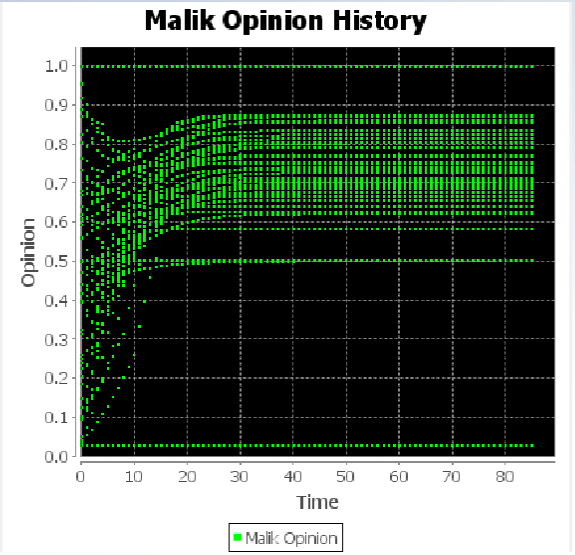
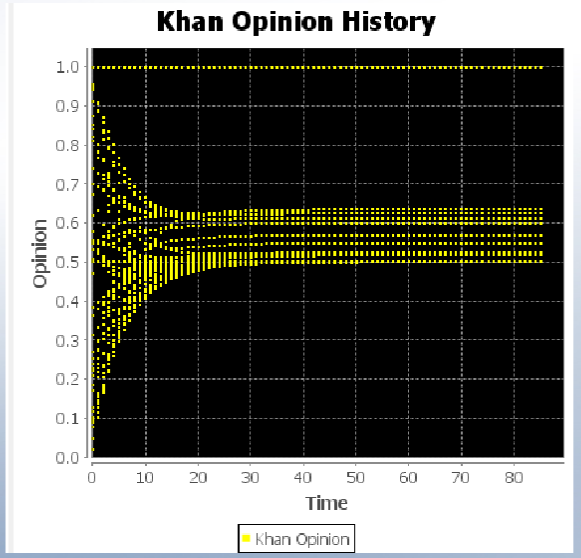
Opinion Profiles







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Exploring Leadership Dynamics

- **Possible reasons for gain in followers**
  - Higher direct connectivity?
  - Higher betweenness (direct and indirect connections)?
  - Clustering of followers?
- **Analyze definitions of power**
  - Followers inhabit central nodes on the graph?
  - Comparative importance of leader nodes?
  - Length of connections?
- **Effects of extremism on equilibrium**
  - Extremist leaders; extremist followers

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Exploring Leadership Dynamics

- **Incorporate threat of violence factors**
  - Taliban uses intimidation to gain power
  - Changes balance of power when physical threat is used; may override low opinion
- **Loss of leader**
  - What changes occur when a leader is removed?
  - What is the effect of competition for leadership?

Relating to the Real World

- **Incorporate actual social network information**
  - Where data are available, use characteristics of actual tribal social networks to define the test network
- **Tie nodes of the network to spatial locations using GIS**
  - Model movement of nodes
  - Add factor of co-location in space as requirement for interaction
- **Modify opinions based on local events**
  - Violent events indicate lack of security – cause opinion of leaders to change
  - Aid from central government may improve opinion
- **Validation and verification**
  - Develop techniques for V&V and apply to model results

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  - Kimberly's guidance and insight on this project are greatly appreciated. I am thankful for the opportunity to work on such a fascinating and challenging project!
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