Space, Time, and Violence in Afghanistan’s [Counter]insurgency

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“numbers exert a magic spell on human minds, particularly if they are presented with the help of computers.”

Calculating Byzantium
Social Landscapes, Physical Landscapes

Fig. 19: Visualisation of the network of the *dynatoi* (the powerful), 1310-1341 (n = 187), with Emperor Andronikos II Palaiologos and Emperor Andronikos III Palaiologos as two centres of gravity

Social Landscapes, Physical Landscapes

(Facebook Banners, collected by Washington Post)
Social Landscapes, Physical Landscapes

(Tahrir Square, 2011; UPI agency)
Leaked Data (25 July 2010)
CJSOTF-A REPORTS ODA CONVOY AMBUSHED IVO GERESK. AT 110740Z FEB 04 CJSOTF-A REPORTED AN ODA CONVOY WAS AMBUSHED IVO GERESK; THE AMBUSH WAS INITIATED BY AN IED WHICH DETONATED BEHIND THE FIRST VEHICLE IN THE CONVOY (CONVOY CONSISTED OF THREE VEHICLES), THE CONVOY WAS HIT SIMULTANEOUSLY WITH SMALL ARMS FIRE. THE CONVOY RETURNED FIRE AND MOVED OUT OF THE KILL ZONE. CJSOTF-A REPORTED THERE WERE NO CASUALTIES AND NO DAMAGE TO EQUIPMENT.


:latitude=>31.80888939, :longitude=>64.51805878,

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Direct / Indirect Fire events: 25,762
IED (improvised explosive device) events: 15,329

Recorded wounded: 26,403 [NATO: 7257; all others: 19,146]
Recorded died: 24,022 [NATO: 1143; all others: 22,879]
Most events have “only” one or two deaths
Majority occur in events $N \leq 4$
Most events have “only” one or two deaths
Majority occur in events N≤4
Spatiality of Conflict in Afghanistan

January 2004

Direct / Indirect / IED
Wikileaks / 15 km FWHM Gaussian
23 February 2011

animations: contact
simon@santafe.edu
Spatiality of Conflict in Afghanistan

animations: contact
simon@santafe.edu
Cycles

Troops deployed (hundreds) and killed (per week) over time.
Cycles

- Troops deployed: hundreds per week
- Killed: per week
- "Snow removal" events
Spatial Scales of Insurgency

nation, region, province, district, or village?

days, weeks, months, years?
At 070700Z NOV 06 TF WOLFPACK reported that the PCC reported the ANP discovered 2 IEDs in Choghay Village 3km Southeast of Salerno. Unit reported the ANP had discovered the IEDs at 0430Z and had disposed of 1 IED. 0748Z PCC reported the 2 IEDs were found along a walkway route vic an ANP CP. ANP found what they believe are recoilless rifle rounds used for the IEDs. No RC devices were found.
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The Spatial Correlation Function

“The probability of finding two things [events, people, villages...] a distance $R$ apart.”

$$P(R) = \bar{n}^2 \left[ 1 + \xi(R) \right]$$
$$P(R) = \bar{n}^2 [1 + \xi(R)]$$

density (squared)  
“the higher the density, the more pairs you can find”

Deviations from random  
\(\xi > 0 : \text{clustered} \)  
\(\xi < 0 : \text{self-avoiding} \)
The Spatial Structure of Conflict

Spatial Conflict Structure

Direct Attacks  IED

Population Distribution

$1 + \xi(\Delta r)$

$\Delta r$ (km)
Clustering “over and above” Population
Clustering “over and above” Population

![Graph showing bias against Δr (km) with population null indicated]

- More clustered than population
- Less clustered
Spatio-temporal

“How do events cluster in time as well as space?”

\[ P(R) = \bar{n}^2 \left[ 1 + \xi(R) \right] \]

\[ P(R, T) = \bar{n}^2 \left[ 1 + \xi(R, T) \right] \]
Space and Time Correlations in Afghanistan [Counter]insurgency
Adaptive Insurgencies

Early: geographically dispersed, short-term correlations

Late: concentrated and persistent in time
What Analysis Can’t Do

1. Predict specific events
2. Predict generalities in new and shifting contexts

What Analysis Can Do

1. Test the narratives that humans use to explain
2. Enrich the vocabulary of those narratives