Mobility in an Online World

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Online games as ‘socio-economic labs’

About Pardus (www.pardus.at)
- MMOG
- 350,000 players
- Opened 2004

Complex behavior of players
- Economic life
- Social life
- Wars, Cartels, Diplomacy, ... 

All data → Social Petri dish
**Data**

**Universe** network
- Nodes: 400 Sectors
- Links: 555 Wormholes
- Large diameter
- not small-world

**Timeseries**: Daily positions of 2,000 players over 500 days
Q  What would random walkers do (WWRWD)?

A  Visit high-degree sectors more often
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A Visit high-degree sectors more often

Q What are players doing?
A Something different
Unique sectors visited

Players

Random walkers

Random walkers (biased)

Szell, Petri, Zhao, Levin  (SFI CSSS 2010)
**Spatial entropy**

\[ H = - \sum_{i=1}^{n} p_i \ln p_i \]

\( p_i = \text{Probability of visiting sector } i \)

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Players

Random walkers

Random walkers (biased)

\( \% \text{ of players} \)
\( \% \text{ of walkers} \)
Mobility in War

Daily jump distances over all 500 days

Exponents over 30-day time-windows

$P(D)$

\[ \alpha = -0.36 \]

(NOT A POWER LAW)

Szell, Petri, Zhao, Levin (SFI CSSS 2010)
At the end of the day

Take-home message
- Players are (very much) not random walkers
- Players have higher mobility in wars

To-do
- Test / extend existing mobility models
- Study how relations between players correlate with their mobility