Where have all the jobs gone? Unemployment trends in Gauteng, South Africa

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Societal challenges
Study background

- Gauteng most urbanised province in South Africa
  - 97% urbanised
  - 11 Million people (20% of country)
  - 5% of total land
- Large informal settlements
- High unemployment
Smart city aspirations

- Create key economic clusters (i.e. ICT, Biotechnology and Aerospace)
- Enhance city operations through use of smart technologies
- Twinning can play a big part in local economic development
  - Lacking because of limited human capacity in municipalities
  - Non-compliance with public entity policies
  - Existing agreements: Hackney, Bethlehem, Sutton
City realities

- Multi-dimensionally poor households
City realities (2)

- Spatially uneven economic activities
- Limited economic growth
  - Even declining
- 21 Million Internet users (national)
- High data costs
Methods and Data

• Census 2011 – spatial detail
• Grouping Analysis in ArcGIS
  ✓ Different conceptualisations of spatial relations bring different results
  ✓ Number of groups with best Pseudo F fit = 15
  ✓ Spatial Matrix file which used K Nearest Neighbours, Inverse Distance OR
  ✓ No spatial constraint, use random seeds
• A few useful models with high $R^2$ values
• Work in progress
## Some results (1)

<table>
<thead>
<tr>
<th>Model No</th>
<th>$R^2$</th>
<th>No of classes created</th>
<th>Optimum No suggested</th>
<th>Method/Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>0.8310</td>
<td>15</td>
<td>Not recorded</td>
<td>Spatial weight file, K nearest neighbour = 10</td>
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<tr>
<td>13</td>
<td>0.8615</td>
<td>15</td>
<td>15</td>
<td>Spatial weight file, Inverse distance</td>
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<tr>
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<td>0.9393</td>
<td>5 (requested)</td>
<td>15</td>
<td>No spatial constraint, use random seeds</td>
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<td>19</td>
<td>0.9927</td>
<td>15 (requested)</td>
<td>15</td>
<td>No spatial constraint, use random seeds</td>
</tr>
</tbody>
</table>
Some results (2)
• Know your constituency
  ✓ 15 classes difficult to comprehend
• Identify distinct areas for intervention
• Combine with suitable digital solutions
  ✓ 96.3% of households have a mobile phone
  ✓ 4G networks reach 75% of the SA population
• Geo-targeted intervention
Recommendations (2)

Cellphones per 100 people

- 2000
- 2005
- 2010
- 2017
Conclusion

• Identify cell phone penetration per area
• Use mobile solutions
  ✓ To advertise opportunities
  ✓ For skills development
• Promote use of free wi-fi hotspots
• Investigate correlation between education level and ICT usage