Regional Science Academy

nr. II, 2016

Special Academic Session (SAS)

‘Big Data, Transport Policies and Accessibility’

Regional Science Academy, in cooperation with

NECTAR Cluster 6

Organizers:
Pierre Zembri
Karst Geurs
Aura Reggiani
Peter Nijkamp
Hans Westlund

Place of venue:
IFSTTAR - bâtiment Bienvenüe - Amphithéâtre (ground floor)
14 boulevard Newton
Champs-sur-Marne
France

June 2-3, 2016
Special Academic Session (SAS)

‘Big Data, Transport Policies and Accessibility’

Aims and Scope

- Thorough and academic reflection on the nature and implications of big data.
- Search for linkage between spatial accessibility issues and big data needs.
- Exploration of implications of spatial big data systems for transport management and policies.

Organization

- Combined session of NECTARists and Members of the Regional Science Academy.
- Brainstorm discussion on new roadmaps for data-accessibility interactions.
- New methodologies for studying these interactions.
- Critical review of experiences and applications.

Structure of Session (Chair: Pierre Zembri; LVMT, Marne-la-Vallée)

1. Opening session: NECTAR meeting the Regional Science Academy (15 min.)
   
   Peter Nijkamp (Tinbergen Institute Amsterdam)

2. Series: The Voice of Regional Science (90 min.)
   
   Michael Batty (UCL, London) on ‘Big Data, Transport and Accessibility’
   
   Folke Snickars (KTH, Stockholm) on 'Big Data Strategy from a University perspective'
   
   Tomas Dentinho (Univ. Açores) on 'Data Requirements for Information Decision Systems of City Managers'

3. Series: Great Minds in Regional Science (30 min.)
   
   Jules Dupuit by Philippe Poinsot (LVMT, Marne-la-Vallée)

4. Round Table Discussion (150 min.)
   
   Participants: Olivier Bonin, Mike Batty, Tomaz Dentinho, Karst Geurs, John Osth, Peter Nijkamp, Aura Reggiani, Folke Snickars, Pierre Zembri

Questions to be addressed in the Round Table:

- To which extent might the surge of big data modify the existing theories? We think especially of: traffic management, mid-term prospective analysis, aggregated data vs. detailed data, etc.
• Which kinds of data are useful? Existing data, which are not used for emerging purposes, could be re-used. But, as they have been collected for a specific use, it would be difficult to re-use them for other purposes. The question of privacy is important as well.

• To which extent will big data modify public policies, network management and regulation practices? This is an essential point in the domain of public transport and the regulation of "new mobility services" like Uber or equivalent initiatives.

• How to share big data? Effective research data should be accessible, reproducible and reusable. This is often problematic with big data sources owned by private companies. How to overcome this? What are the needs of the Regional Science Academy and broader scholarly community for big data warehousing?

5. Recommendations and Conclusions (30 min.)
# Scientific Programme

## June 2nd (NECTAR Cluster 6 Presentations)

<table>
<thead>
<tr>
<th>Time</th>
<th>Session Details</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>12.00</strong></td>
<td><strong>Welcome buffet</strong></td>
</tr>
</tbody>
</table>
| **14.00 - 16.00** | First session  
Arnaud ADAM, Adeline DECUYPER, Isabelle THOMAS (UCL Louvain), On the uses and illusions of ICT data for urban modellers in Brussels  
Pedro GARCIA-ALBERTOS, Miguel PICORNEIL, Maria HENAR SALAS-OLMEDO, Javier GUTIERREZ (Univ. Complutense & Kineo Mobility Analytics), Exploring the potential of Big Data for accessibility assessments: a case study for the Madrid Metropolitan Area.  
Carmen ZORNOZA-GALLEGO, Julia SALOM-CARRASCO, Ignacio MAESTRO-CANO (Univ. Valencia), From Twitter data to mobility information: detection of user’s home location. The case of Valencia province, Spain  
Nicolas COULOMBEL (UPE-LVMT), Mohamed KHALIL EL MAHRSI (IFSTTAR-GRETTIA), Emmanuel MUNCH (UPE-LVMT), Etienne COME (IFSTTAR-GRETTIA), Latifa OUKHELLOU (IFSTTAR-GRETTIA), Staggered work hours at the university: an economic evaluation using smart-card data |
| **16.00 - 16.30** | **Pause**                                                                                                                                                                                                     |
| **16.30 - 18.30** | Second session  
Cyril PIVANO, Olivier BONIN (IFSTTAR-LVMT), Spatial disaggregation of origin / destination data: a statistical approach  
Ioannis BARAKLIANOS, Louafi BOUZOUINA, Patrick BONNEL (LAET-ENTPE, Lyon): Does measure of accessibility influence residential location choice modelling? A case study in Lyon urban area (France)  
Karst GEURS (Univ. Twente), Borja Moya GOMEZ (Univ. Complutense), Marcin STEPNIAK (Polish Academy of Sciences), Spatio-temporal inequalities in job accessibility in the Netherlands  
Lien BAKELANTS, Ann VERHETSEL (Univ. Antwerp), The different dimensions of job accessibility. A case study in Belgium |
| **20.00**     | **Dinner in a nice place near the venue**                                                                                                                                                                     |

## June 3rd (Joint Session NECTAR Cl6/Regional Science Academy)

<table>
<thead>
<tr>
<th>Time</th>
<th>Session Details</th>
</tr>
</thead>
</table>
| **09.00 - 10.15** | Third session  
Ouassim MANOUT, Patrick BONNEL, Louafi BOUZOUINA, Local accessibility of transit stops: a new method to define centroid connectors |
<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.15 - 10.45</td>
<td>Pause</td>
</tr>
<tr>
<td>10.45 - 13.00</td>
<td>First part of the Joint Meeting NECTAR-<em>Regional Science Academy</em></td>
</tr>
<tr>
<td>13.00 - 14.30</td>
<td>Common Lunch in the internal restaurant</td>
</tr>
<tr>
<td>14.30 - 17.30</td>
<td>Round table discussion</td>
</tr>
<tr>
<td>17.30 - 18.00</td>
<td>End of the Joint Meeting NECTAR-<em>Regional Science Academy</em></td>
</tr>
<tr>
<td>20.00</td>
<td>Optional Dinner</td>
</tr>
</tbody>
</table>

*Umut TÜRKM (Univ. Verona), Socio-Economic Determinants of Student Mobility and Inequality of Access to Higher Education in Italy*
SUMMARY REPORT

Organizers: Pierre Zembri, Karst Geurs, Aura Reggiani, Peter Nijkamp and Hans Westlund

Rapporteur: Peter Nijkamp

This combined meeting of the NECTAR cluster on ‘Accessibility’ and members of the Regional Science Academy was a logical follow-up of an ABC that took place earlier this year in Stockholm on ‘big data’. In the Paris meeting the focus was not so much on ‘big data’ per se, but on the challenges and opportunities of using ‘big data’ in transport systems, with particular emphasis as accessibility problems.

The meeting had a mixed character: the focus was partly on empirical research and big data treatment, and partly on a thorough reflection and conceptualisation of ‘spatial big data’. The framing of these issues was introduced by a comprehensive review of the issues concerned by Michael Batty, who in the Voice of Regional Science series convincingly demonstrated the potential of these new approaches by means of an empirical illustration for the London transport system and the use of the Oyster Card. Also the presentation by Karst Geurts highlighted the importance of ‘spatial big data’ issues in transportation research; followed by a presentation by Tomaz Dentinho. A welcome addition to the debate was also offered by Philippe Poinsot, who in the ‘Great Minds’ session provided a very informative presentation of the work of the great French scientist Jules Dupuit, who laid the foundations for a social economic analysis of transport investments.

‘Big data’ has indeed become an important research and policy issue in the past years, not only in the ‘hard’ sciences, but also in the social sciences and humanities. Research on ‘spatial big data’ has rapidly followed the great many challenges in ‘big data’ systems. Clearly, it is still an open question whether big data provide also better insights; this depends on the framing of the research question, on the appropriate indicators for testing meaningful propositions, and on the smart selection of theoretically founded research issues.

Clearly, ‘big data’ does not only mean large volumes of data. In the latter case, multivariate statistics might also be a valid option. But ‘big data’ also refers to complex dynamic systems, to non-linear evolutionary data patterns, and to multi-actor interdependencies. First attempts to deal with such challenging research tasks in the social sciences can be found in computational neural networks (CNN) and social network analysis (SNA). But in current ‘big data’ systems we have to
link sometimes a set of ‘big data clouds’ to another set of ‘big data clouds’, and this is a formidable research challenge. Examples in our digital world can be found in GSM systems, GPS systems, sensors, camera data, digital network information, inter-active social media (Facebook, Twitter, etc.).

A clear concern of the use of ‘big data’ in transportation research is formed by the consistent definition and statistical treatment of massive volumes of ‘big data’. This also prompts questions on consistent data comparison and on open access to ‘big data’ (e.g., mobile phone data) under strict privacy conditions. It is foreseeable that data warehousing under open access conditions will become a major challenge to the future of data-driven research in transportation science.