Stéphane Roche is an Engineer and Geographer, a full professor of Geospatial sciences and vice-dean for research at the Faculty of forestry, geography and geomatics, Université Laval, Québec City, Canada. He teaches GIS and spatial analysis (undergraduate and graduate) and, a graduate seminar on Geospatial data quality. Roche is especially interested in exploring the role of social geolocation (LBSN), open data and crowdsourcing to support the implementation and operation of smart city concepts. He is also involved in research projects dealing with spatial skills and spatial reasoning as the main sources for a new form of urban intelligence. Roche has recently contributed to the Ethics and Smart City Panel of the Commission for Ethics in Sciences and Technologies of the Government of Québec. Roche is an active member of the Information Technologies and Society Institute (ITIS - Université Laval) and of the Centre for Research in Geomatics (CRG – Université Laval). He is also a research affiliate to the MIT Senseable City Lab and Honorary Principal Fellow to the Department of Infrastructure Engineering at the University of Melbourne, Australia.

Fields of expertise:
- Smart City and Urban Intelligence
- Equipped Mobility and Wayfinding Support
- Volunteered Geographical Information and Citizen Engagement
- Traces, Connected Objects and Algorithmic Personalization
- Spatial Skills and Spatial Reasoning
- Digital Strategy, Place and Space, Ethics
- Open Data: Quality and Risk Mitigation

Selected References:
« The 19th century was a century of Empires, the 20th a Nation-State century. The 21st century will be a century of Cities. »

(Wellington Webb, Mayor of Denver, 2009)
BUILDING SMART CITY ON SPATIAL THINKING

Stéphane Roche

UNIVERSITÉ LAVAL
SMART CITIES 3.0
CITIZEN CO-CREATION

SMART CITIES 2.0
TECHNOLOGY ENABLE, CITY-LED

SMART CITIES 1.0
TECHNOLOGY DRIVEN

https://www.fastcompany.com/3047795/the-3-generations-of-smart-cities
SUSTAINABLE DEVELOPMENT GOAL 11
Make cities and human settlements inclusive, safe, resilient and sustainable.
Une stratégie numérique à l’échelle de la ville
The Intelligente City Inukshuk
(Roche et Landry, 2017)
Intelligence is the ability to process information to achieve one's goals; the ability to link (bind) components, elements between them, to show logic, causality, deductive and inductive reasoning, including the capacities to recognize patterns.

Etymology
Latin *intelligentĭa* / "faculty to understand"
Prefix *inter-* / "in between"
Radical *legĕre* / "choose, pick"
or
*ligāre* "linking"
Urban Place

\[ f(\text{(Geo)Location, Event, Name}) \]
URBAN INTELLIGENCE
Thinking Spatially

Mike Goodchild, 2012

« Spatial Cognition: how we think about the world around us
Spatial reasoning: how we come to conclusions »
Everything is related to everything else, but near things are more related than distant things.

-Waldo Tobler
Geographic Information Science I

Why does a smart city need to be spatially enabled?

Stéphane Roche

First Published February 7, 2014 | Research Article

Abstract

In this report I propose to examine the concept of the ‘smart city’ from the standpoint of spatial enablement. I analyse emerging research on smart cities, particularly those addressing the potential role of GISciences in the development and implementation of the concept of smart cities. I develop the idea that the intelligence of a city should be measured by its ability to produce favourable conditions to get urban operators (citizens, organizations, private companies, etc.) actively involved into sociospatial innovation dynamics. To obtain such a commitment, I believe that operators should be able to develop and mobilize (digital) spatial skills so that they could efficiently manage their spatiality. In other words, I argue that a smart city is first of all a spatially enabled city.
Are ‘Smart Cities’ Smart Enough?

Stéphane Roche1, Nashid Nabian2, Kristian Kloekl3, and Carlo Ratti4

1 Centre for Research in Geomatics, Université Laval, Québec, Canada, and SENSEable City Laboratory, Massachusetts Institute of Technology, Cambridge, Massachusetts, USA
2 SENSEable City Laboratory, Massachusetts Institute of Technology, and Harvard Graduate School of Design, Cambridge, Massachusetts, USA
3 SENSEable City Laboratory, Massachusetts Institute of Technology, Cambridge, Massachusetts, USA, and University IJAV of Venice, Italy
4 SENSEable City Laboratory, Massachusetts Institute of Technology, Cambridge, Massachusetts, USA

Stephane.Roche@scg.ulaval.ca; nnabian@gsd.harvard.edu; kloeckl@mit.edu; ratti@mit.edu

We live in the Global Location Age. “Where am I?” is being replaced by, “Where am I in relation to everything else?”
Introduction of PennState Geospatial Revolution Project (http://geospatialrevolution.psu.edu/)

Abstract

In our contemporary societal context, reconfigured by wide spread impact of Geo-localization and wikification on urban population’s everyday work and life, two related concepts, “spatially enabled society” and “smart city”, have emerged from two different but related fields: the Global Spatial Data Infrastructure community drives the former while practitioners and researchers in urban planning, urban studies and urban design are more concerned with the latter. We believe that technology enhanced, ICT-driven solutions that spatially enable the members of urban populations, contribute to smart operation of cities, and we suggest that a dialogue between the communities that foster these two notions needs to be established. We seek to provide an ontology of categorically different, but still related, spatial enablement scenarios along with speculations on how each category can enhance the Smart City agenda by empowering the urban population, using recent projects by the MIT SENSEable City Lab to illustrate our points.
LA VILLE INTELLIGENTE AU SERVICE DU BIEN COMMUN
Lignes directrices pour allier l’éthique au numérique dans les municipalités au Québec

COMMISSION DE L’ÉTHIQUE EN SCIENCE ET EN TECHNOLOGIE

Québec
Stéphane Roche

Stephane.roche@scg.ulaval.ca
@geodoc31