Abstract: Sense of Participation in Real Time Monitoring Systems

Luis Bohorquez (L.E.BohorquezMontemayor@tudelft.nl)
Caroline Nevejan (c.i.m.nevejan@tudelft.nl)
Frances Brazier (f.m.brazier@tudelft.nl)
Participatory Systems Initiative, TBM Delft University of Technology, The Netherlands

This paper explores how the sense of participation is influenced by real time monitoring systems in everyday participation practices in hybrid network environments. In social and mobile networks, and in many online services, individual behaviour is monitored and instant feedback is provided to system participants. For example, advertising on websites adapts to user surfing behaviour within seconds, GPS systems indicate traffic jams immediately on the basis of information they receive from navigation systems in people's vehicles, financial deals on the stock market immediately influence next deals, mobile applications augment physical environments with information on possibilities for entertainment when moving through the city based on information received from participants in a system. Real time monitoring systems are an inextricable part of individuals’ participation in everyday routine activities. Systems have become participants in their own right in communities of people (Brazier and van der Veer, 2009).

This paper explicitly does not focus on the effect of storing and retrieving large data sets over time. It focuses on how individuals’ sense of participation when performing presence, and giving signification to participatory practices with self, others, and things in time, place, and context within these monitored and hybrid network environments. To explore the sense of participation in real time monitoring systems two concepts are introduced. First the concept of the third witnessing perspective (Nevejan 2012) is elaborated upon to better
understand how real time monitoring systems affect participation practices. Secondly the notion ‘migration trajectory’ (Bohorquez, Nevejan, Brazier 2013) is introduced to better understand how people experience participation practices in hybrid network environments. On the basis of these two theoretical concepts this paper discusses results of in depth interviews with experts on their daily participation practices.

Third witnessing perspectives emerge when many participants feed a system with large quantities of distributed data in real time, and when the results of systems’ operations with these data are instantly sent back to its participants. Technology provides the platform upon which participant’s input is transformed into a ‘real time’ representation of the participation practices of all participants at a given moment in time over time. This representation of all participatory practices triggers individual behaviour to adapt. These adaptations also become part the real time ever changing representation of all participatory practices in the real time monitoring system. The simple definition of participation is to be part of a larger whole, with the ability to act and take responsibility. In this paper the real time monitoring system, including its participants, is the larger whole. Participants are constantly adjusting their performance and significations while interacting with the larger whole.

Third witnessing perspectives shape the way individuals perform presence and give significations to values of trust, engagement, autonomy, and attachment. They ultimately define the more or less permanency and consistency of individuals’ participatory practices and experience. Not only individuals but also larger organizations, governments, and business organizations can act upon the information and communication that third
witnessing perspectives provide. Being observed and recorded in routine activities by larger organizations raises paradoxical feelings of more or less certainty and security. Individuals may perceive real time monitoring systems as beneficial and as a threat simultaneously. The concept of participant migration trajectory is introduced to understand experience in participation practices.

A migration trajectory is defined as an episode of time in which individuals perform presence and give significations to their own and others' trajectories in hybrid network environments (Bohorquez, Nevejan, Brazier 2013). The sense of participation develops through participation practices and migration trajectories. The sense of participation in migration trajectory, is influenced by feelings of permanency and consistency when an individual participates in multiple worlds simultaneously.

The concept of migration trajectory relates to three dynamics. The first dynamic addresses having presence as the capacity to steer towards wellbeing and survival (Riva, Waterworth & Waterworth 2004). This dynamic is explored by asking the question Where do I go now?. The second dynamic addresses directing presence towards the world. Presence is treated as readiness to act towards and with the world in the everyday (P. Turner 2010). This dynamic is explored by asking the question Do I feel I have other possibilities?. The third dynamic addresses having a sense of possibility and is central for the incorporation of existential feelings in day-to-day life (M. Ratcliffe 2005). This dynamic is explored by asking the question Does it make a difference to my world?.
These three fundamental existential questions provide the grounding for the concept of migration trajectory (Bohorquez, Nevejan, Brazier 2013).

First, *where do I go now?* This question refers to being ready to act to experience a geographical presence mobility and distribution of its actions (physical, mental, and digital) when they acknowledge the sense of open-ended possibilities that networks facilitate in real time communication. The infinite number of possibilities that networks facilitate perpetuates the readiness to experience the uncanniness of the whole world. It steers presence mobility and demands for new physical and emotional adaptations for it alters conventional forms to approach a diverse number of worlds simultaneously in the everyday.

Second, *do I feel I have other possibilities?* This question refers to the decisions that create the multidimensionality of the individual by performing presence in hybrid network environments. Do individuals feel they have the possibility to choose with whom, with what regularity, in which place, and in what context to perform and negotiate their presence in day-to-day interactions. The fact that an individual approaches presence as ready to act, in an overwhelmed number of other possibilities that networks facilitate, mandates an examination on how individual choices relate to internal expectations, serendipitous acts, or external forces. This question also explores how individuals perform presence and give signification to their interactions when the feel to have no other possibilities but participating in monitory systems.

Third, *does it make a difference to my world?* How individuals steer towards wellbeing and survival, reflecting on the signification is core to this aspect. This question relates to feelings but also to a sense of reality and situatedness.
(Ratcliffe, 2005). Analysis of migration trajectories provides insight in how individuals participate in multiple contexts with more or less permanency and consistency simultaneously in day-to-day life. This question exposes how the individual(s) self-interest primes or not more or less permanency and consistency of participation practices when it perceives the sense of possibilities offered when being monitored in real time.

In the analyses of the responses to these questions the connection between migration trajectories and the third witnessing perspective is made. For example most automotive navigation systems are real time live monitoring systems. *Where do I go now?, Do I have other possibilities?* and *What does an automotive navigation system contribute to my world?* shed light on how experts experience the contribution of such systems to their everyday participation practices. This experience is also influenced in a real-time monitoring (participatory) system by the question *What do I contribute to these systems?* and *what does that contributing contribute to my world?* To understand the dynamic between an individual and an automotive navigation systems, it is necessary to understand the third witnessing perspective that a system provides. For a system such as TomTom, the third witnessing perspective is generated by a Geographical Information System to which participants deliver data about their traffic routes, that form the bases for shared maps that are created which indicate traffic jams for example. Also the interface of input and output in the vehicle contributes to the experience of the third witnessing perspective.

Results of this study identify everyday factors that influence the sense of participation in systems in which real time monitoring systems play a significant
role. Migration trajectories and analysis of presence through a third witnessing perspective are the means.

Bibliography


Luis E. Bohorquez M.
Rokin 116 K
Amsterdam
1012 LB NL
Tel : +31 653 912 267
Email : L.E.BohorquezMontemayor@tudelft.nl

Luis Bohorquez constructs conceptual frameworks to explore individuals’ participation practices in complex day-to-day participatory systems. His multi-faceted education and work experience is grounded in six countries—in design, R&D, strategic development, multidisciplinary data visualization, sustainability, philosophy, STS, sociology and media studies. Bridging different domains and people is fundamental to his work. Besides his consultancy work his current academic research is as PhD fellow in the participatory systems initiative—Delft University of Technology—TUDelft

Education

PhD Researcher in Science and Technology- Participatory Systems TUDelft Delft University of Technology-(2012-Present) - Delft, The Netherlands
MSc. in Philosophy of Science, Technology and Society University of Twente. one year (2009-2010) – Enschede, The Netherlands
Master in Marketing (1990–1992) Universidad Regiomontana – Monterrey, Mexico
Bs. in Industrial Design (1982–1987) Universidad Autonoma de Nuevo Leon- Monterrey, Mexico

Academic Writings


Work Experience

Sept. 2006 to Dec. 2009
Sustainable Design Platform- FLOOV Visionary Design - Founder and Director (Spain - Netherlands). - First sustainable design consultancy and platform in Madrid.
Istituto Europeo di Design in Madrid- Teaching Design for Sustainability Courses and workshop
Circulo de Bellas Artes de Madrid – Sustainable Design Courses for Professionals.
Dutch Design Week 2009 – Sustainable Design workshop.
IE Business School Madrid - Sustainable Design conferences

Sept. 2001–August 2006
IDEAMAPS (sold to Xplane EMEA) - Madrid, ES - Founder and Operations Director - Multidisciplinary data visualization: consulting, art direction and management.
Clients: Vodafone, Endesa, La Caixa, Enagas, Orange, British Telecom, Grupo Prisa.
**EXPORT ENTERPRISES S.A.** Paris, FR
Consultancy business firm dedicated to international business development focus in Spain and Latin America.

**VITRO S.A.** is one of the largest glass manufacturer in the world (Dallas, USA)
Strategic New Product Development Manager
Conceptualization, management, development, prototyping and packaging.

**VITRO S.A.**- Monterrey, MEX
O.E.M. Product Development Manager (International market)
Responsible for engineering product development. Production processes, molding engineering, quality and assurance engineering, testing and prototyping, first production assessment, and bridging sales and production negotiations.

**VITRO S.A. VitroTec:** R&D Division - Monterrey, MEX
Engineering Design Research
Responsible for research and analysis of glass manufacturing processes.

Oct. 1988–April 1989
**GM General Motors** - EL Paso, TX, USA
Engineering Design Electronics

**CARTON TITAN S.A.** Monterrey, MEX
Packaging Designer
Curriculum Vitae Caroline Nevejan

Dr. Caroline Irma Maria Nevejan
NieuweAmstelstraat 63
1011 PL Amsterdam
The Netherlands

Telephone: +31 6 11 536159
Email: nevejan@xs4all.nl
Websites: www.nevejan.org

Delft University of Technology
Faculty Technology, Policy and Management
Jaffalaan 5
2600 GA Delft
The Netherlands
Email: c.i.m.nevejan@tudelft.nl
Telephone: +31 15 27 88380
Website: www.participatorysystems.org

FORMAL EDUCATION
2007 PhD University of Amsterdam
1986 Master Communication Science (doctoraal), University of Amsterdam
1984 Bachelor Social Science (kandidaats), University of Amsterdam
1976 Atheneum Beta, Utrecht
1975 Alliance Française, Switzerland

CAREER
2010- Tenured Researcher, Participatory systems, Dept. of Technology Policy and Management, Delft Technical University
2007– 2009 Fellow with Intelligent Interactive Distributed Systems group, Dept. of Computer Science, VU University Amsterdam
Fellow with the Primavera Research program of the Business School of the University of Amsterdam
2005 – 2007 PhD “Presence and the Design of Trust”, Amsterdam School of Communication Research (ASCOR), University of Amsterdam. Supervised by Professor Cees Hamelink, Professor Sally Wyatt
2005 – 2007 Fellow with Computer Science, University for Professional Education Amsterdam.
1999 – 2004 Director Research and Development, University for Professional Education Amsterdam.
1995 – 2007 Research Fellow of Performing Arts Labs (UK), foundation for artistic research
1994 – 1999 Co-founder and director Waag Society, independent media lab, Amsterdam
1988 – 1999 Program director Paradiso, musical venue and international conference site

Prestigious and invited formal affiliations:
Current: Crown Member Dutch National Council for Culture and the Arts (Raad voor Cultuur)
Board member Foundation for Democracy and Media
2004 - 2005 Core member Amsterdam Arts Council
2002 - 2004 Design team and program committee Digital University of the Netherlands
2000 - 2001 Assessor multimedia masters Trinity College, Dublin, Ireland
1997 - 1998 Reviewer I3 program, European Commission
1997 - 2002 Chair and Member of the Board of Doors of Perception, Amsterdam
1995 - 1995 Committee on Media-Education Ministry of Education, Culture and Science
1995 - 1997 Board member Amsterdam Cultural Studies, Amsterdam

**Prize**
National Rotterdam Design Prize 1997 for The Reading Table for Old and New Media

**Scientific Affiliations:**
- Member International Society for Presence Research
- Member of Advisory Board Faculty of Education, University of Amsterdam

**Research Funding**
2011 - 2013 European Institute of Technology (EIT), ICT Labs, ICT Human Mediated Activities, Project: Mediating Presence (my role is principal investigator, with Charlie Gullstrom, KTH Stockholm). Budget 2012: € 220.000, Budget 2013: €305.000
2008 Foundation NLnet (my role is principal investigator, budget € 30.000)

**PhD committees:**
2011 Enrique Gomez-Illata Cazares. “Mexico and the Global Problematic, Power relations and Communication in Neoliberal Mexico”, University of Amsterdam (pending)

**Academic references to professional work:**
Thackara, J., 2005. In the Bubble, designing in a complex world. MIT Press, USA.
Castells, M., 2003. The Internet Galaxy. Oxford University Press, UK,
Lovink G., 2003. Dark Fiber MIT Press, USA

**Collaborations:**
2012 Professor Kitty Zijlmans, University of Leiden, on artistic research
2011 Professor Catholijn Jonker, Delft University of Technology, on negotiation in mediated contexts
2010 Dr. Charlie Gullstrom, School of Architecture, KTH, Royal Institute for Technology, Stockholm Sweden – on mediating presence
2009 Dr. Satinder Gill, Centre for Music and Science, Cambridge University – on tacit knowledge and rhythm
2009 Professor Frances Brazier, Delft University of Technology – on participatory systems
2009 Professor David Benyon, Napier University Scotland, on presence research
2009 Dr. Aditya Dev Sood – Chicago University – Virtues in Witnessed Presence
2008 Professor Paul Wouters, Professor Sally Wyatt - Netherlands Royal Academy of Sciences – On communicating and visualizing social science
2008 Dr. Vibodh Parthasarathi – Jamia Millia University New Delhi India – on Internet Governance, in the context of World Summit on the Information Society (UN)
2005 Professor Patrick Humphries & Garrick Jones, London School of Economics – on developing methodologies for collaborative authoring of outcomes
2002  Professor Luc Steels - Sony Research Paris/Vrije Universiteit Brussel – on the future of learning
2001  Professor Sugata Mitra – Newcastle University UK - on self-organization in learning processes of children using public interfaces to Internet technologies
1999  Professor Stephen Heppell – Ultralab, Anglia Polytechnic University, UK – on new learning strategies for children using information technologies
1996  Professor Ezio Manzini, Domus Academy/Polytechnic Milan, Italy – on integrating information technology with ecology for sustainable product and service design
1995  Professor Derrick de Kerckhove, McLuhan Program Toronto - on mediating presence and emerging collective intelligence
1994  Professor Jan Nederveen-Pieterse & Professor Philomena Essed – on decolonization of the imagination
1993  Professor David Garcia, University of the Arts London - on tactical media
1990  Professor Gerard de Zeeuw, Center for Cooperative Technology, University of Amsterdam – on designing networks for collaboration and support
1989  Professor Geert Lovink - Center for Networked Cultures, Amsterdam, The Netherlands – on the emerging network society

Selection of Invited Lectures
2013  Open Plenary: Participatory Dynamics for change. World Social Science Forum, Montreal
2012  Producing Presence, KTH Stockholm
2012  Being and bearing Witness in Communities of Systems and People, Unlike Us, Institute for Network Cultures, Amsterdam
2011  Climate for women in science: a lifecycle approach. TU Delft
2010  Designing presence and trust in the process of interaction, KTH Stockholm
2010  Interdisciplinary Research, creating Being-Here.net, IN3, Open Universidad de Catalunya
2009  Utopian Practices, The Virtual Knowledge Studio (KNAW) and the Arts and Genomics Centre of the University of Leiden.
2008  Can You See What I Know, Royal Netherlands Academy of Arts and Sciences
2008  Samizdat in the Technological Jungle, Centre for Culture, Media and Governance, Jamia Millia Islamia University, New Delhi, India
2007  A continuous trade-off between Presence and Trust, DECIS Lab, Delft
2005  The social responsibility of the engineer, ALE, TU Delft
2004  Innovation in India, Surf, Utrecht
2004  Designing experience, Design Academy Eindhoven
2003  Structural design in education, DoorsEast, Bangalore, India
2003  Distant learning, WACE, Rotterdam
2003  The pace of change, Infodrome, Dutch ministries and Parliament
2001  The new media mixes, BBC Imagineering, Sevenoaks, UK
2001  Integrated Learning environments, Future of Learning, Sony Research Paris
2000  How to design learning environments for children, CHI 2000, Rotterdam
1999  Children are citizens, Doors of Perception on Play, Amsterdam
1999  In need for territorial waters for copyright, Erasmus Conference, Amsterdam
1998  The social agenda of MIT Medialab, Mind over Matter, Copenhagen
1995  Designing communities in Europe, TJ Watson, IBM, NY
PUBLICATIONS

Books:


Journals:


Nevejan C., 2011. Veiling Inside Out & Outside In, in *TeleTrust for networking bodies, RTTRSKSCH journal*, Publication by ARTI research group at Amsterdam School of the Arts. Vol. 3 No. 2


Nevejan C., 2008. Can you see what I know, in *KEHO magazine*, PEACH community EU

Editor of special issue

Book Chapters:


Nevejan, C., 2010. Sensing the system, reducing moral distance from global climate change. In *We can change the weather, a 100 cases of changeability*. Editor: Marleen Wijnants. VUB Brussels

Nevejan, C., 2010. Mas en Matilda, about the child's right to speak. In *The library of 100 Talents, It can be done*. NBD/Biblion Uitgeverij, Den Haag


Nevejan C., 2008. De vitale rol van kunst en design in de toekomende tijd. In "Crossover, Kunst, Media en Technologie in Vlaanderen". Ed. Liesbeth Huybrechts. Publisher: Lannoo Campus &Instituut voor beeldende, audiovisuele en mediakunst, Gent, Belgium


**Conference papers:**

Bohorquez L., Nevejan C., Brazier F.. 2013. The sense of Participation. This paper is presented at ‘MIT8 2013: public media, private media’, Massachusetts Institute of Technology, Cambridge, USA.

Bansal L, Nevejan C. Brazier F., 2012. *Mobile stories: collaborative research on mobile technology*. This paper is accepted by 11th International Workshop on Internationalization of Products and Systems in Bangalore, India.

Nevejan C., 2011. Developing a Study-Site on Witnessed Presence. This paper is accepted by the *International Society for Presence Research Annual Conference – ISPR 2011*, Edinburg

Nevejan C. & Brazier F., 2011. Time Design for Building Trust in Communities of Systems and People. This paper was accepted by *ICORD’11, International Conference on Research into Design*, Indian Institute of Science, Bangalore, 10-12 January 2011


Nevejan C., 2009. Spatiotemporal movements in communities of practice, in which human beings and autonomous systems participate. This paper was accepted by the workshop *Human Interaction with Intelligent & Networked Systems*, organized by the *2009 International Conference on Intelligent User Interfaces*, Sanibel Island, Florida.


Research sites

- Surfing the dissertation: Together with Mediamatic Lab I made an experimental environment which facilitates surfing through the dissertation. The dissertation was loaded into a database on paragraph level. As author of the text I attributed metadata to every paragraph. As result, one can surf through the dissertation and it still makes sense.
  http://dissertation.being-here.net

- Witnessed Presence and Systems Engineering: On this site the source material is gathered and presented of an interdisciplinary exploratory study into Witnessed Presence. It shows 20 in-depth interviews with people from India, Great Britain and the Netherlands who are thinking out loud about how their personal and professional practice has changed because of technology. Coming from a variety of disciplines they elaborate first insights in fundamental dynamics of social structures in networked contexts. The site includes film fragments of the interviews.
  http://www.systemsdesign.tbm.tudelft.nl/witness

- Collaborative research platform Being-Here: Publishes ongoing research into witnessed and mediated presence and creates a collaborative research platform at the same time. Interdisciplinary research between professional knowledge, artist research and academic papers are published in relation to one another. As of 2012 the European Institute of Technology assists in further developing this concept. The site is used as design platform for students.
  http://www.being-here.net

Other publications
Co-author of publications of the Netherlands Council for Culture and the Arts between 2006-2013 (www.cultuur.nl)
Research focus

Foundations of design, engineering and management of participatory systems in human organizations and society: systems designed to support human participation. Participation in networked society, in which social technical ecological systems merge, requires presence, situational awareness, trust and the ability to act and interact at different levels of organisation. Integrity is key. In networked societies, network, networking, networked and network making powers are dependent on global coordination based on local interaction between systems. Locality is a leading principle, as is integrity and human experience. Research questions address the principles of witnessed presence, agency and awareness, collaboration, self-management and distributed coordination.

Design and analysis of participatory systems focuses on the behaviour of individual systems, their interaction, and organisational structure. The primary focus of our research is technology: technology as a system, an enabler, a catalyst. Theories, models, and research methods for participatory system design and engineering are subject of research.

The multi-agent system paradigm provides a means to model, design, implement and evaluate the behaviour and robustness of many of such systems, most often large scale distributed systems (eg distributed energy management, dynamic supply chain management, crisis management). The AgentScape platform supports large scale distributed multi-agent based simulation to explore and analyse emergent effects of system behaviour during design, before prototyping. Distribution of processes and data in large scale systems is a core concern for participatory systems: integrity, dynamic distributed clustering, aggregation, robustness, security and complexity mandate technological solutions.

In other cases interaction and collaboration within and between systems, enabled by technology, is explored and analysed in real-life systems (virtual presence, visualisation, GDR, cloud-computing), requiring new technology to support interaction/collaboration, to acquire situational awareness and empowerment.

Publications

More than 200 academic publications, see for more information

www.participatorysystems.org/

Research Career

Full professor Foundation of Engineering Systems, Chair of Systems Engineering and Participatory Systems Initiative, Faculty of Technology, Policy and Management, TUDelft, 2009 - now

Full professor Intelligent Interactive Distributed Systems, Department of Sciences, VU Amsterdam, 2000-2009
Research director Stichting NLnet 2000-2008
Assistant/Associate professor, Artificial Intelligence, Department of Mathematics and Computer Science, VU Amsterdam 1991-1999
Researcher, Cognitive Science, Department of Psychology, VU Amsterdam 1983-1991
Scientific Programmer, Department of Psychology, VU Amsterdam 1981-1983

Board of Directors

Supervisory Board of Kennisnet 2013 - now
Board of Stichting NLnet Labs 2000 - now
Chair/member Board of LNVH - Network of Women Professors NL 2006 - now
Chair/member Board of Stichting ThinkQuest Nederland 2008-2010
Scientific Board ICIS - BSIK programme on Interactive Collaborative Information Systems 2006-2012
Board member, Secretary Stichting NLnet 1989-2007
Board member Stichting InterNLnet 2000-2003
Board of Commissioners of NLnet Holding BV 1996-1997
Board member Stichting NLUUG 1985-1995
Director EurOpen Ltd 1991-1993
Vice-chair Board EurOpen 1990-1992

University related advisory committees

• NWO (Dutch NSF) Interdisciplinary VIDI committee 2013
• NWO Smart Energy Systems Programme Committee 2011 - now
• NWO Task force Scientific ICT infrastructuur 2010-2011
• Chair NWO Glance Research Programme Committee 2004-2007
• NWO Advies Commissie Informatica 2002-2007
• Programme Board Digital University NL 2002-2004
Education

Doctorate
Cognitive Ergonomics. Supporting the information retrieval process, VU Amsterdam

MSc Mathematics, specialisation Computer Science, minor in Cognitive Psychology, teaching qualification Mathematics.

Department of Mathematics and Computer Science, VU Amsterdam