UNIVERSITÉ DU LUXEMBOURG

FSTC Faculté des Sciences, de la Technologie et de la Communication

Inventing Communities of Communication (ICC)

Conviviality in Digital Cities

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I. Introduction

- Application domain is **digital cities**
  - Online-portals from city administrations to service their citizens
  - Exploits the graph-like structure of web sites, where pages are nodes and links are edges, as spatial environment and stage for interactions between individuals
- Topic is **conviviality**
  - Interdisciplinary: computer science, sociology, economics, cognitive sciences
  - Applies to individuals interactions

I. Introduction: Conviviality

- **No clear model** nor any singular vision of conviviality
  - Definitions we found are either incomplete or domain specific
- A convivial place is one where we are **welcome** and **feel at ease**; Similarly, we feel at ease with a convivial individual
- In every day life, we use a range of techniques to coordinate our activities, one of the most important is the use of **norms** and social laws.
  - Norms def. is "a standard model , or pattern regarded as typical" while in MAS, it depends on the use, e.g. constraints, obligations or goals.
- Conviviality is based on norms and conventions
  - Presupposes implicit/explicit regulation mechanisms among the individuals of a given group
  - based on a consensus
  - Allows individuals of a group to interact with each other following shared rules

I.3 – Introduction: Motivation

- Conviviality plays an important and complex role in internal regulations of social systems and social interactions:
  - Reinforces social cohesion
    - When people interact, they do so with the understanding that their respective perceptions of reality are related. As they act upon this understanding their common knowledge of reality becomes reinforced
  - Reduces Miscoordinations that result from breakdowns in common knowledge

II. Background: Pedagogy

- In convivial ambient places," it feels good to be together", you learn, play and socialize
  - Ackerman's Piazzas are structured by the community and reflect the changes of its members' identities, ideas and dreams
- Convivial learning methods intertwine learning and teaching
  - Cavallo and Sipitakiat; M.I.T. Future of Learning Group
- Convivial environments are user-friendly and simulate physical reality with intelligent agents in virtual environment
  - IST Advanced training systems and distance learning

II. Background: Semiotics

- **Positive** conviviality is a social form of human interaction (Schechter).
  - Allows individuals to **accommodate** to situations (Somov). Like conflict, it is based on agreements and contradictions
  - Is the reconciliation of unity and diversity: unity of the society constituted of divers individuals (Hofkirchner)
- **Negative** conviviality **masks** the power relationships and social structures that govern communities (Taylor).
- A convivial information society is described as:
  - personalized, Simplified, of Technical quality (reliable, adaptable, etc.) and with uniformed medias and representation systems. (Lamizet)

II.Bkgd: Philosophy & Sociology

- A convivial society allows creative powers of individuals by giving them **control over their tools**
  - Relations between humans, humans and nature, humans and technology (Illich)
- A given community is convivial when the goals of individuals meeting there is to **share their knowledge**
  - Implies mutual effort, trust and shared commitments or interests (Polanyi)

III. State of the Art: Programs

- **Convivio** net Consortium 03-05 goal: Establish researchers and professionals network dedicated to develop convivial technologies
  - People-centered, support communication and interaction, increase social cohesion and community identity
- Societe de l'**Information Conviviale,** User-Friendly Information Society, one of FP5 EU themes (1998-2002)
  - User empowerment, human interactions, ambient intelligence, distributed services
  - Evolved into FET (Future & Emerging Tech.), Content for all, ASIMIL (Aero user friendly SIMulation based dIstant Learning), etc.

III. State of the Art: Multi Agent Sys.

- Pedagogical agents (Goms, boff& vicari 04)
  - Agent represents pupil logged in
  - Keeps track of emotional state and social behaviors to recommend most appropriate pupil as tutor to another pupil in need of help
- Reputation systems (sichman& casare 05)
  - Agent A compares agent B actual behavior to ideal one (norm) and concludes if norm is observed/violated, evaluates and propagates
- Conversational convivial agents (France Telecom R&D 06)
  - A convivial agent is rational and co-operative
    - Capacity for negotiation, contextual interpretation, flexibility of the entry language, of the interaction, produce co-operative reactions and adequate response forms

III. State of the Art: Some Aspects

- Artificial sociable **companions** (Y. Wilks)
  - permanent agents attached to single users
  - Act as intermediaries for all information sources that users cannot manage
    - companions for seniors: technology assistance (web search, etc.) and companionship. Companions for juniors: teach, explain and advise.
- Mixed-Initiative Interaction (A. Horvitz)
  - **Filter** "appropriately" incoming information to shield users from incoming disturbances
    - measure user's information: keystrokes, number of opened windows, content, scrolling activities, events in calendars, location and time of day to filter incoming information (emails, phone calls, etc.)

IV. Formalism: Discussion

- Digital City Domain: Organizational model allows to consider the following point of views
  - structural, functional, contextual and normative
- Web site structure: our environment as described by (Weyns &al. 06)
  - Spatial and organizational structure
  - relates to activities (communication, definition and enforcement of rules regulating the interactions)

IV. Formalism: Normative Specs.

- Normative specifications bind structural, functional and contextual specifications
  - Rights and duties of roles and groups with goals, in specified contexts (Gateau & al. 05)

IV. Formalism: Normative Specs

- Role
  - Interaction Protocol between individuals
  - Individuals can have several roles according to tasks
- Group
  - Set of individuals (agents) sharing the same global goal. Ex: all users looking for tourism information
- Individual
  - Active entity that communicates and functions (has a role) within a group

IV. Formalism: Normative Specs

- Context
  - The situation and transitions that influence the dynamics of organization
  - allows to adapt norms to specific situations
- Criteria
  - Set of conventions composing a norm
  - Allows to adapt to different social, organizational requirements

IV. Formalism: Model Proposal

- Group g conviviality evaluation:

  $Conv_g = f(Uconv_1, Uconv_2, \ldots, Uconv_k)$; With k users

- User u conviviality evaluation:

  $Uconv_u = l(c_1, c_2, \ldots, c_n)$; with n criteria

- Criterion evaluation:

  $C_i = h(p_{i1}, p_{i2}, \ldots, p_{im})$; with m parameters in c_i

IV. Formalism: Model Proposal

- Conviviality of group g in context c:

  $Conv_{gc} = f''(Conv_g, Conv_c)$;

- Context c conviviality evaluation:

  $Conv_c = f'(a_1, a_2, \ldots, a_r)$; With r attributes

V. Conclusion: Summary, Next

- **Research**
  - Domain definition
  - State-of-the-Art and background Digital Cities, Conviviality
  - Formalism
- **Implementation**
  - A conviviality scenario using agent systems (AGR, Agent-Group-Role/Madkit; Moise; ...)
- **Simulations**
  - Testing conviviality scenario with agent systems (AGR, Agent-Group-Role/Madkit; Moise; ...)
- **Publications**
  - Submit workshop proposals for next year to the following conferences:
  - SID 2007: 6th Intl. Workshop on Social Intelligence Design. Trento, July 2-4 (deadline: March 1)
  - ASAmI'07: Symposium on "Artificial Societies for Ambient Intelligence". AISB Convention. Newcastle, April 2-5 (deadline: Jan. 8)
  - CSCW'07: ACM Conference on Computer Supported Cooperative Work (info TBA)

APPENDIX

Brief Activity Review: July-Oct. 06

- E-city luxembourg project
  - Attended monthly meetings with e-city and eLuxembourg to review case studies.
  - Upcoming presentation to eCity representatives Nov. 30: conviviality in digital cities.
- Attended SONY CS Research Lab Paris Symposium
- Fall Teaching
  - Information visualization, in collaboration with Michael Hilker
  - Data mining and security, MINE group
- Organized Prof. C. Pelachaud's visit and presentation to the Luxembourg university. October 23, 06

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