"Making Use of Serendipity: A new Direction for Pervasive Computing from a Sociological View"

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A few words …

- This talk is an adventure for me in the psychology department.
  - Not sure why I said yes so quickly to the invitation …
  - Not sure what to say …
- This proposal is early and preliminary. It may seem irrelevant, inappropriate, crazy, etc.
- So I am a bit under-prepared, so I will keep it short and discussion-oriented.

Introduction

- Serendipity:
  - Making fortunate discoveries by accident
  - 意外收獲
- Serendipity in everyday social interactions
  - Discover interesting people through unplanned encounters
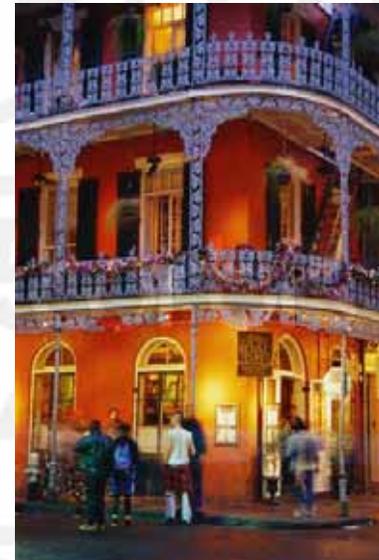
Examples

- "Titanic": meeting between DiCaprio (a poor boy) and Winslet (a rich girl)

- "三國演義": meeting among 劉備 張飛 關羽

- How often do you discover interesting people through unplanned encounters in your real life?

Perhaps A Better Title ...

- "How to apply computing technologies to enrich your social life in your everyday face-to-face encounters with people?"
- Goal: Enrich Social Life
- Setting: Face-to-face encounters in public spaces
  - Same time, same physical space (co-location)
  - Not virtual & online
- Use: ad-hoc wireless technology

Past: "Lovegetty" (1998)

- A successful commercial device in Japan
  - Improve social life ("find love")
- Three buttons to show your romantic availability
  - Watch a Movie
  - Go out for food
  - Others
- Short-range wireless radio
- Beep you when a match is found.

Now: "Toothing"

- Popular culture in UK on trains & buses

- Bluetooth cell phones
  - Bluetooth: a short range (10 meters) wireless radio

- Messaging to each other's cell phones
  - "Bored? Talk to me"
  - Short-range = nearby
  - Co-located SMS

- Create social interactions in public spaces

Future?

- Create interaction opportunities that seem serendipitous, but in fact, they are computer-mediated.
  - What is the chance that you will meet a person with the exact same birthday?
  - What is the chance that you will meet a female SUMO wrestler?
- Create more interaction opportunities?
  - Quantity -> every public space visit will be full of people
- Create better interaction opportunities?
  - Quality -> every public space visit will have interesting people who you want to meet
- Why? You can decide how computers can help social life.
  - Parenting: Parents may want their children to be with certain people, and not others.
  - Business: you may want to get to know people with certain skills.

Application Scenario I

- You are about to leave your office for lunch.
- Your social computer agent tells you to wait for 2 minutes in your office.
- So you wait for 2 minutes.
- You go to the elevator.
- You find …
  - the company chairman who promised you a salary rise several months ago, but need to be reminded again.
  - a long-lost high school class-mate in the elevator (who works in Europe and just happen to be visiting a client here).
  - a dream girl/boy with the ideal 星座, look, age, body type, blood type, etc.

Application Scenario II

- You are walking on the street, deciding which restaurant for lunch.
- Your social computer agent tells you to go to the XYZ Café.
- So you go there.
- Five minutes later, you find people walking into the restaurant
  - who like Boston Red Sox as much as you do.
  - who are also planning to take an adventure trip to Africa.
  - who also saw the movie "Troy" and love it as much as you do.
- You are constantly "surrounded" by people you are interested.

Getting User Context

- We can derive (and leverage) interesting social context information from GPS-enabled mobile devices:
  - 5Ws about the phone owner
  - Locations (where)
  - Calendar (what)
  - Call log & address book (whom)
  - Emails
- Artificial serendipity matching on the social context information
- Privacy and security are issues.
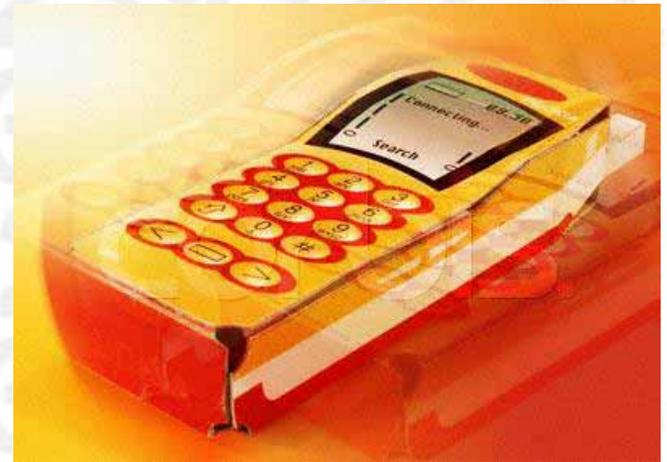
Approach

- Understand well-known sociological theories on social interaction:
  - Presentation of Self
  - The Strength of Weak Ties
  - Uncertainty Reduction Theory
- Based on these sociological theories as our guideline, how to apply computing techniques to enhance these everyday, serendipitous, interactions with co-located people?

Presentation of Self
(Cooley 1902, Mead 1934)

- The "self" of a person is composed of two parts:
  - Inner Self: personal understanding of self
  - Public Self: presentation perceived by outside
- The public self can change based on the interaction context
  - Context-awareness
  - Location, occasion, interacting context, mood, etc.

Scenarios
(Digital Presentation)

- Participants in this conference can use MyAura to broadcast their "digital outfits" with professional information (name, affiliation, email, research interests). James can quickly view information from his PDA and do contents/interests searching and matching.

- James also uses MyAura to broadcast his intention to look for people to hang out after the conference. Ed receives message from James, locates James on a map, and went to talk with James.

- At night, James and Ed switch into stylish cloths, and their MyAuras also automatically switch to a new "digital outfit" with social information (single, adventurous, etc.).

Strength of Weak Ties
(Granovetter 1973)

- Model interpersonal network as a network of nodes
  - Nodes = people
  - Links (ties) = knowing relationship
- Ties can be strong (boss) or weak (distant relative in New York).
- Strength of weak ties says that
  - "Weak ties are better for spreading information than strong ties".
  - Spread rumor through strong vs. weak ties
  - Learn new information from people with strong vs. weak ties

Scenarios
(Social Information Dissemination)

- "James, the singer of Jazz Band, will have his debut performance three weeks later. He uses MyAura to spread this information and reach as many people as possible (weak ties)."

- "Jane is fan of Britney Spears"=. She is using MyAura to look for teenage friends (strong ties) to go to the live concert with her".
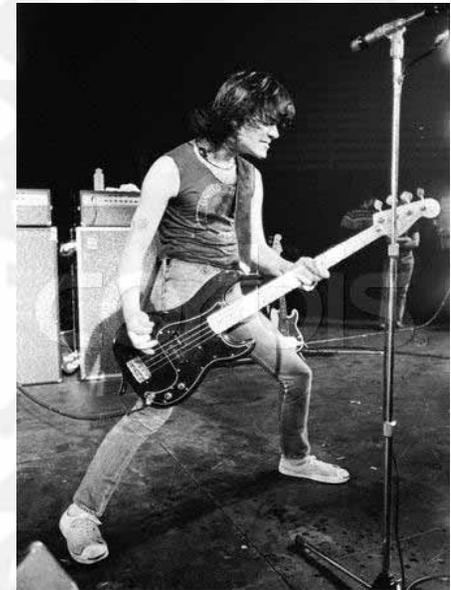
Uncertainty Reduction Theory
(Berger, 1979)

- Collect information to predict other's attitudes and behaviors in order to reduce the uncertainty of interaction.
  - Typical approach to form impression and initial relation development during a face-to-face interaction
- Passive Strategy: observe passively
- Active Strategy: manipulate environment and observe
- Interactive Strategy: ask the target direct questions.

Scenario
(Uncertainty Reduction)

- Jane is currently sitting in a café. She is using MyAura to deliver a questionnaire (are you cool?) to co-located MyAura(s) who are interested to initiate communication. Based on the responses (I am cool), Jane's MyAura will try to deduce uncertainty (attractiveness) of the correspondent and alert Jane for possible interactions.

- A person's MyAura derives social cues from context information, and matches with social cues from co-located people's MyAuras.

Three Related Projects

In-Hospital Suicide Prevention

- Detect "dangerous activities" of patients in hospitals
  - Biometric wearable sensors (heart rate, temperature, blood)
  - Environmental sensors (camera, microphone, accelerometer, pressure, light, RFID, etc.)
  - Activity recognition
  - 3D & 2D location tracking
  - Privacy is less of an issue.
- What are these dangerous activities?
- What sensors can be used to detect these activities?

Personal Experience Computing

- Imagine a wearable camera can record your entire life ….
  - Memory augmentation (google search your past)
  - Relive past memory (memory triggers)
  - Sharing personal experience (storytelling)
  - Reminder (long term memory loss)
- Personal experience computing is about computing support for
  - Recording archiving, retrieving, searching, analyzing (annotating), editing, sharing, etc., of personal experiences.
- Largest database ever
- Privacy is a huge issue.