Abstract

Our system uses Bluetooth technology to track person-to-person interactions in order to model the spread of diseases & viruses. Additionally, our system lets users self-report symptoms and sends alerts when a user’s risk of infection increases.

System Design

(1) Beacons are placed in desired tracking area
- Nearby phones tracked for interactions

(2) Interactions between phones tracked
- Users report symptoms & illness through app

(3) Data sent to backend, network is created

(4) Network visualized using D3, shows sick/healthy nodes

(5) Users’ risk level generated, alerts of outbreak sent to phone

Features

- Track Interactions
  - Using Bluetooth beacons and iPhone-iPhone communications, human interactions are captured.

- Create Network
  - A backend program runs an algorithm that creates a network graph based on these data.

- Report Symptoms
  - Users who feel sick can report their symptoms.

- Risk Analysis
  - Symptom data is used to generate risk levels for users in the network.

Motivation

Hospitals

- Manage outbreaks & quarantine patients
- Identify “patient zero” for disease

General Public

- Give users risk level based on network.
- Provide alerts when disease enters network.

Features

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Application Screenshots

- A system to track person-to-person interactions was designed
  - Disease propagation can be viewed and assessed
  - A user's risk level in a network can be determined
  - Future work includes scaling the system for hundreds/thousands of users

Conclusion

Present overview of user’s network:
- Number of people sick in network
- Risk level
- Common symptoms
- Suggestions to prevent sickness

Diagnosed by doctor?

Yes
- Report diagnosis
- Update network
- Alert users in network

No
- Present likely illness & remedies
- Present overview of user’s network:
  - Number of people sick in network
  - Risk level
  - Common symptoms
  - Suggestions to prevent sickness

If sick
- Report symptoms
- Users select if sick or healthy
- If healthy
- Present likely illness & remedies

Report diagnosis
- Update network
- Alert users in network

If healthy
- Present likely illness & remedies
- Present overview of user’s network:
  - Number of people sick in network
  - Risk level
  - Common symptoms
  - Suggestions to prevent sickness

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