

DataTweet – a public service for opportunistic communications

Pierre Brunisholz

Advisors:

Andrzej DUDA

Franck ROUSSEAU



June 15 2015

Table of Contents

Introduction

Context

The Water Cycle Analogy

How ?

Take advantage of the WiFi Infrastructure

City Wide WiFi Coverage Study

Actual Work

Access Points Maps

Users Connectivity Estimation

Future Work



Table of Contents

Introduction

Context

The Water Cycle Analogy

How ?

Actual Work

Future Work



Context

IoT Growth

- Smart Cities
- Smart Home

Smartphones Expansion

- Equipped with accurate sensors
- Mobile Users can be seen as a Data Source

DataTweat

- Aim to fulfill the lack of interoperabilities
- Aim to provide an efficient gathering / delivering system
 - Publishers / Subscribers
 - Content Centric

The Water Cycle Analogy

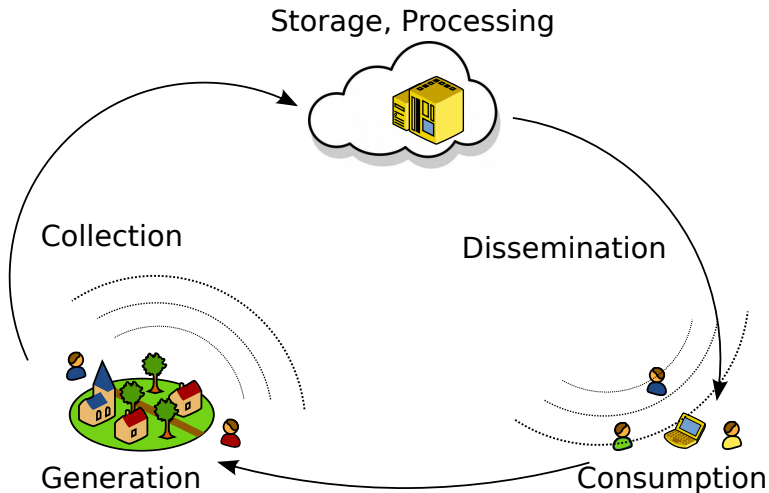




Table of Contents

Introduction

How ?

Take advantage of the WiFi Infrastructure
City Wide WiFi Coverage Study

Actual Work

Future Work

Take advantage of the WiFi Infrastructure

Hypothesis

- Huge underused WiFi coverage in actual Cities
- Internet Providers have to provide a dedicated data channel

Pros

- Compared to 3G / 4G, WiFi is more Energy Efficient
- Already deployed Infrastructures

Cons

- WiFi is not built for mobility

Problem

- What is the feasibility of such a proposal ?

City Wide WiFi Coverage Study

Goals

- Validate the coverage hypothesis
- Estimate the mobility application

Data

- Grenoble Freeboxes Dataset
- Grenoble Generated Dataset

How ?

- Analyze the AP's positions
- Simulate the connectivity duration with different connection deltas / handoffs and different paths



Table of Contents

Introduction

How ?

Actual Work

Access Points Maps

Users Connectivity Estimation

Future Work

Access Points Maps



Grenoble downtown Freeboxes coverage



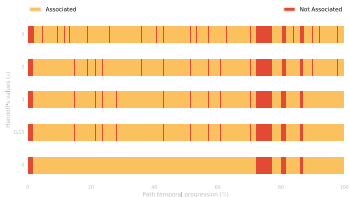
Grenoble downtown simulated coverage



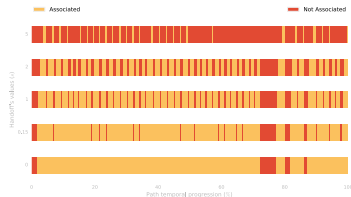
Users Connectivity Estimation



Randomly generated path with the Freeboxes Dataset



WalkingConnectivity

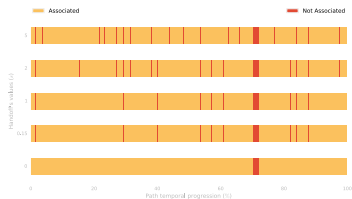


Driving Connectivity

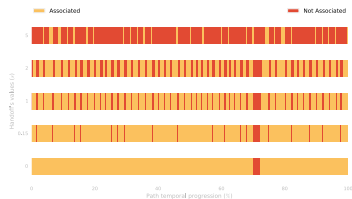
Users Connectivity Estimation



Same randomly generated path with generated Dataset

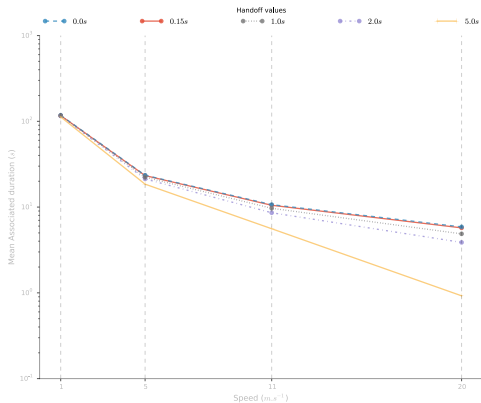


Walking Connectivity



Driving Connectivity

Users Connectivity Estimation



Mean connection time with 100 different paths



Table of Contents

Introduction

How ?

Actual Work

Future Work

Future Work

On the WiFi Coverage

- Improve the handoff value model
 - Analyze smartphones' scanning and associating process
- Extend to others cities

On the WiFi Mobility

- Improving WiFi handoff while using BLE as a side channel
- Study WiFi fast association mechanisms in order to seamlessly send datas



Thank you for your attention

Questions?