

TOPIC: DIY Networking

1 SHORT DESCRIPTION OF THE PROJECT(S):

Exploring how an independent (not part of existing network infrastructure) computer network could solve a community challenge in Volos. Our group is exploring both the underlying technologies (configuring wireless network nodes: occupy.here and Raspberry Pi; and how to connect them together in mesh networks) along with considering how they can be applied: (1) bringing together locals to inform them about what is happening in the city and how to address everyday problems; (2) Setting up public hotspots enabling citizens to log on and find information they seek (3) encouraging locals to see their local area in new ways (4) providing services for visitors to the city such as tourist information, playful and informative engagement with the environment.

2 MEMBERS OF THE TEAM:

Eftychia Datsika, edatsika@iquadrat.com

Evangelia Kokolaki, evako@di.uoa.gr

Fabrice Bigirimana, fabriceb@ifi.uio.no

Faranak Hardcastle, f.hardcastle@soton.ac.uk

George Darzanos, ntarzos@iti.gr

Ilias Syrigos <ilias013@gmail.com>

Ioannis Koutsimpos, ikoutsim@auth.gr

Harris Niavis, harniavis@gmail.com

José Fernando Zazo, josefernando.zazo@estudiante.uam.es

Kostas Chounos <kostashn@gmail.com>

Laura Querci, laura.querci@gmail.com

Mark Gaved, mark.gaved@open.ac.uk

Rafael Leira, rafael.leira@estudiante.uam.es

Virgilio Passas <virpassas@gmail.com>

Yusuf Sani y.sani@lancaster.ac.uk

Ayomide Ajayi a.ajayi@lancs.ac.uk

3 DISCIPLINES INVOLVED:

Computer science, mathematics, sociology, networking.

4 HOW DO YOU FORESEE THE ROLE OF THE DIFFERENT DISCIPLINES FOR THIS PROJECT?

Computer Science is related to the data that is accumulated from everyday local activities. Networking is used so that the data from remote and distinct areas are combined in order to satisfy the needs in a larger scale. People communicate and exchange ideas either for outdoor activities or for everyday problems. Mathematics is the tool used to categorise and analyse the data collected in order to address to everyday problems effectively. Sociology could be interesting, if we consider how people can be involved in a new point of view about the city and how they feel about exposing themselves to the public. Many ethical problems arise and security is a big issue when it comes to networking and brainstorming in a larger scale.

5 WHAT DO YOU PLAN TO PRESENT ON FRIDAY PANEL?

In Friday, we will present the different projects that were designed and developed during this week, as an outcome of the discussions among the DIY Networking team and other groups of the summer school. Each team of our group will give a presentation and demonstrate their project and how it is expected to be integrated in the city of Volos and engage its citizens. We came up with five projects:

1. Mailbox
2. Ask a question - Quiz in University square
3. Volos Photobooth
4. Calamargo
5. Volos Creative Corner

Moreover, we will give a short presentation about Wireless Mesh Networks (WMN) and what they could be used for. The first three projects are implemented in collaboration with people from the Urban Interaction group. More specifically, people from the DIY Networking group provided the necessary technological solutions and methods for implementing and making reality novel ideas of people from the Urban Interaction group.

The last two presentations are ideas proposed and implemented by members of our group (DIY Networking).

More details regarding each one of the projects can be found below:

5.1 MAILBOX: LEAVING A MESSAGE

Who: Jose, Rafael, George

What will be presented: video

Specification:

Users notice a sign, which tells them to connect in a specific Wi-Fi network.

They log in using their smartphone and a web page tells them there is a question related their current location.

The users write down their answers on a paper and posts them.

The system makes a positive feedback (noise, light, other)

5.2 ASK A QUESTION

Full specification here:

<https://docs.google.com/document/d/111-oWP59DW4zucu6pp726NDlqJ8h5LF3cuUnCgyDuxA/edit>

Who: Ben from Urban Interaction, Faranak

What will be presented: Occupy node, slideshow

Specification:

Users have a notice which tells them to log in

They log in on smart phone

web page tells them there is a “question of the day”

User can choose answer

Answer is released after a time delay (e.g in the evening)

When user logs in after this time they see the answer

Questions: How many concurrent users?

5.3 VOLOS PHOTOBOOTH

Who: Fabrice, Yusef, Urban Interaction Design group

(concept presented by Urban Interaction Design group)

What will be presented: Mesh network, demo running on Raspberry Pi

Specification:

User logs in to system

See picture of 4 people (composite of A, B, C, D)

Upload their own image (image E)

Image added to create new composite (images B,C,D,E)

Image A cropped and added to composite of old images in a manner that is anonymous (lots of images)

User can see the composite of many people

Possible Issues: DIY networking team are not sure (1) if Raspberry Pi's have the power to do the required image processing

5.4 CALAMARGO (CALAMARI+ARGO):

Who: Eftychia, Evangelia, Faranak, Laura, John

What will be presented: slide show, Occupy.here demo.

Idea:

Social Network (DIY Network Workgroup Idea)

Calamargo is a gamified pseudonymous social network that focuses on behavioural changes of individuals and companies in the city of Volos. Calamargo invites :

1. Citizens to identify problems and suggest solutions (eg. There is some rubbish on a particular street, insulting graffiti on public property that needs removal etc.)
2. Visitors to provide info about their short stay in Volos, things that could make their life easier, share nice or unpleasant experiences and let the locals know of cases of exploitation.
3. Administrators to reward the individuals/companies/authorities that address a problem, by receiving praise and recognition, as well as getting a Calamargo badge and special privileges.
4. Users to identify both major problems and potential value or point out a case of abuse or defamation through a simple voting system (thumbs up/down -report).

5.4.1 Calamargo Presentation - Postcard edition -Volos

Calamargo is a gamified pseudonymous social network that focuses on behavioural changes of individuals and companies in the city of Volos as well as improving (?) public services.

Different hot-spots are spread all over the city. Calamargo invites :

1. Citizens to identify problems and suggest solutions (eg. There is some rubbish on a particular street, insulting graffiti on public property that needs removal etc.)

2. Visitors to provide info about their short stay in Volos, things that could make their life easier, share nice or unpleasant experiences and let the locals know of cases of exploitation.

3. The administrator has the ability to reward the individuals, companies, or authorities that listen to the complaints and address the problems. Rewards can include endorsement and recognition, as well as getting a Calamargo badge and special privileges.

4. Using Calamargo users can identify weaknesses, potential problems, as well a value or point out a case of abuse or defamation through a simple voting system (thumbs up/down -report).

(Calamargo enables users to hear the public opinion about themselves by identifying weaknesses, problems, and what that they are liked for .)

5.5 VOLOS CREATIVE CORNER

Who: Laura Querci

What will be presented: slideshow (OCCUPY.HERE: Located nodes of forums in Volos ppt)

Ideas:

Located nodes of forum on

Security improvements Boundaries of communities, parks gardens

Health Disease forum and sharing stories about symptoms, feeling, emotions (as Narrative medicine)

Childhood forum for neo mums (to create contact and relationships and to deal with postpartum depression)

Creative corner Proposals of cultural events (for ex. music or arts events) or solutions on how to get cool ideas about neglected places

Left food Management and collecting left food among restaurants and bakeries

Jobs Sharing performances

Books Comments/opinions about the last read book, advices books

Education Collecting and sharing ideas about improvement activities in schools

Reporter point “Bottom up Tg” by Citizens can upload videos, photo

5.6 REPORTING ON MESH NETWORKING

Who: Fabrice B., Jose, Rafael, Ajayi

What will be presented:

Reporting on the value of mesh networking / DIY networking

Mesh networks are a tool. As every tool, it need some good ideas and people if we want the tool exploited. What is a mesh network? A Mesh Network is made by many different devices, from routers, to laptops. Each device, has the possibility to extend the network. Those devices can have a very low cost (of about 30€ raspberry pi, 41€ BeagleBone Black or 59€ the WandBoard), and allow us to extend the network as far as we want, and share information. Also, those kind of devices can be powered easily by batteries or solar panels, making its maintenance almost null.

One simple example can be a to extend a free internet over all the network using only one node physically connected to internet. Since it is a DIY network, each participant can share its house internet connection and made a better Mesh Internet Network over the City of Volos. ¡Its in the hands of the citizens of Volos!

However, the Mesh network (and its devices) do not need to be connected to the internet in any way, allowing to have just a “local network” in the city. In our local network there can be local services that in fact everyone in the network can register. It can be useful for share every kind of information, for tourists, for an artist to share his/her music, made a local forum, and whatever you can imagine.

The distance that a device can afford, depends on its wifi antennas quality, and how many obstacles are in the area (buildings, trees...). In the best case we can have about 100 metres in a round covered by only one device, in the other hand, in the worst case we would have only about 10 or 20 metres around the antenna. However, if necessary, it is possible to extend a wifi network over 10 Km with only one **DIRECTIONAL** antenna (ref: <http://www.wifi-online.es/kit-s-con-wifisky-chip-ralink-3070/247-kit-wifisky-3000mw-parabolica-27db-wifi-abaks.html> about **80€/antenna**). It is needful to state that we can perceive a wireless mesh network as a community-wide infrastructure; in this scenario the expansion of the mesh can be carried by whosoever requires connectivity to the network. An important aspect of the deployment of

wireless mesh networks is that they are self-organising, self-healing and configures autonomously. The entire network also benefits from the provision of resources from participating nodes, which makes the requirements minimal, unlike traditional networks. Potentially, the community can utilize the network for emergency scenarios, remote information dissemination and low-cost telephony using devices equipped with analogue telephone adapters (ATAs). It could be very usefull to connect the center of volos with other around cities (which are in fact also part of Volos) [like Agridia?].

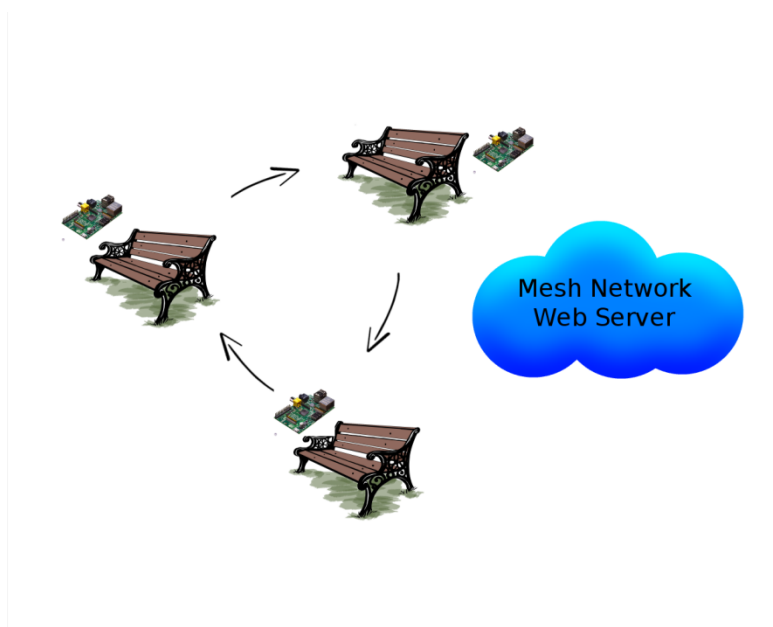
We have to speak about the mesh potato, that is a very important thing in very rural areas, that it not only gives internet or a local area, it also provides a telephony services.

6 ANNEX

6.1 JOSE/RAFAEL'S NOTES ON THEIR WORK:

Some measurements:

- Mesh Network: Question-Answer(s) Project



Requirements:

- There would be “Questions” and “Answers”
 - When someone answer a question, a random answer of other one is presented to him
- There would be a Chat more or less interactive that allows concurrent discussions.

6.2 OLDER IDEAS AND FUTURE PLANS FOR COLLABORATION WITH OTHER GROUPS :

Monday and Tuesday’s notes on ideas: We had a number of ideas: some of these might be presented on Friday

1.Sharing an anonymised network in a coffee shop: This might have security/ethical implications but the idea was just to test it privately in order to get an idea about the proximity of the network. It might be considered as a democratic (demographic?) approach. (Outdoors activity for the whole group) ((DONE, TIME)

2.Bench : The liberty square was introduced to us by the urban design group and it was mentioned that it used to be a hub for political/social activists to voice their concerns. Also the crowdsourcing group introduced the concept of visible/invisible groups. An idea was to use benches to connect visible/invisible places. (Ioannis,....) (benches may also be used as public hotspots for locals or tourists to log in and inform themselves about historical sites, places of interest, festivals or promotions) (7)

3. Public festival : Involves capturing videos and sharing messages. (Could be achieved with occupy.here nodes). Occupy nodes are small and low powered, so could be set up where there are temporary gatherings of people in places that don’t have network connections (or slow network connections). People could upload messages for each other: to leave their thoughts about the event, to arrange to meet, etc. Connecting to this will also be free (no network charge) so maybe it’s attractive for people who have to be careful of their phone network charges.(3)

4.Raspberry Mesh: Developing a mesh network using Raspberry Pis, so everyone could be able to add to a community DIY network at low cost,it enables uploading different types of content and downloading them.This uses inexpensive and portable components (eg.power) which can provide flexibility and accessibility. (Jose, Rafael,....). We’re not sure anybody has tried building a mesh network using Raspberry Pi’s before so this might be a good project to continue with after this week. (TOP)

5.Know your neighbourhood: This idea is based on the existing concepts from other groups (the Visibility group particularly) and aims to identify how much the citizens of Volos know about their neighbourhoods. It involves getting advice from the visibility group to help create a survey (or reusing the existing one) and place hubs in different locations (getting advice from urban

design group) to gauge how much citizens of Volos know about their neighbourhood. (maybe it can be integrated with the bench idea, as a fun game) (1)

Photo exhibition: This involves uploading already existing photos and photos taken in recognizable places or public events, otherwise in not well identified places, as some little streets, that promote local groups.(0) Tourist info....resources... information provision unidirectional - Raspberry../ **Argo** was initially introduced to us by the urban design group . An idea is to collaborate with this group to create a mythological site: the objective could be involving citizens on sharing historical knowledge with the tourists. (can be integrated with the bench idea?)

Both of the ideas below use open data to empower citizens rather than aggregating their own data :

8.Collecting and reporting congestion data in public centers such as tax office, police station and hospitals. It was discussed that often people are not aware how congested an office is before they plan to go there. This will involve using motion sensors to monitor the traffic and installing screens to report them. (how is it gonna be implemented?)

9.Collecting parking data and reporting them using screens in the entrance of the parkings in Volos. It was discussed that parking has been an issue in Volos and it would be nice to know if there is any empty spot before entering the parking. (Most parking places in Volos are private and not public,so this wouldn't address the congestion in the streets caused by cars parked by the pavement).

10.Calamargo is a futuristic fictional character that needs your input to grow :

Problem: There is a diverse range of opinions about how to use the technology in the city of Volos to come up with solutions for issues or improve existing services.

Our suggestion: Calamargo is an educational and gamified network that focuses on behavioural changes of individuals and companies as well as improving public services. It uses crowdsourcing to identify both major problems and potential capital.

The theory:

The Name: Calamari was the first thing that was introduced to some of us when we entered Volos and at the same time we are very impressed with the myth of Argo.

The Material : Cognisphere → Katherine Hayles or bring in your ideas(available at <http://tcs.sagepub.com/content/23/7-8/159.short>)

The Concept:

Each tentacle of the calamari represents a different section of the city (eg.private, public, industry, culture, ...) and all of these are working towards the same aim : *Moving Calamargo forward.*

The practice:

Different nodes are installed in different parts of the city. Each node invites citizens and visitors to :

1. Identify areas of improvement or/and suggest a tip for improvement (eg. There is some rubbish on street x)

OR

2. Identify an existing area of strength or/and suggest ways of capitalising on it (eg. The sea front is lovely)

3. Calamargo listens, records, captures and reports on the data collected from volunteers who are willing to contribute to the network.

4. The network is gamified and follows certain rules. For example:

1. Users need to enter an audio password (eg. "Kaliméra Calamargo" which means good morning Calamargo) to be able to enter the network.(Also could give a choice of turning 360 for those with a humorous mood/ using motion capture devices)

2.If a “complaint” is addressed, the company/ individual gets rewarded by getting a Calamargo badge. As a result of this, where ever that a Calamargo sign/logo is seen, we know that Calamargo has been there ! (eg.resembling the classic superhero narrative, eg. Batman,superman,...)

3.Calamargo is colour coded to identify the different sectors (eg.culture,heritage,industry...).

4.There should be strict rules about *defamation* in place as this is not tolerated in Calamargo.This can be managed by an administrator or could be crowdsourced as people could be asked to report on the abusive notes. If administration is needed, then the number of issues per week should be restricted (eg.20 spots a week that can get filled on a FIFO basis)

5. Applying machine learning → so that in the future Calamargo can come up with its own humorous(or non humorous?) suggestions !

6. Good ideas are filtered by crowdsourcing (Apache voting system).Consensus meetings can be arranged (eg.The weekend) in which users with their phones (eg.Calamargo hats?) go in a node range and get a certain time to give their votes.

7. Nodes should be installed in a good balance of visible/ invisible locations.

6.3 WEDNESDAY DIY GROUP NOTES:

First we met with the Urban Interaction group to tell them what equipment we have (3 x occupy.here nodes, 1 x Raspberry Pi with sensors, a mesh network of two routers and a Raspberry Pi).

We heard their 4 ideas: photobooth, messages in a bottle, clothing exchange, myth

We then went back to our group, worked on building mesh networks and occupy.here. The Urban Interaction design group then came back and made a second presentation at the end of the day:presenting their ideas in a simpler form to help us understand what they need from us, how they would like to work with us.