

# Call for interest for a PhD and a research fellowship position at DISI, University of Trento.

## The context

The Advanced Networks and System labs invites applications for a PhD and a research fellowship in the context of the H2020 research project netCommons.

netCommons<sup>1</sup> is a three-year research project that focuses on Community Networks (CNs), large bottom-up communication infrastructures that are blooming in many European and non-European countries. CNs represent a unique setting to perform inter/trans-disciplinary research since they offer a mix of technological and social challenges: netCommons includes three Computer Science departments, one Sociology department, two Law research groups and one non-profit organization to approach the theme under several point of views.

The PhD and the research fellow will work on mainly three themes:

- Studying and collecting information about the existent CNs, their network properties and their social organization in order to produce mixed techno-social monitoring metrics that the communities can use to have the “pulse” of the network and the community. These metrics will help the community in shaping decisions about the growth, the ownership and the management of the network.
- Continuing the work done in the ANS lab<sup>2</sup> about the optimization of routing functions for large mesh network based on topology metrics.
- Developing the PeerStreamer peer-to-peer streaming application<sup>3</sup> in order to be easily deployable in CNs. This involves porting it to dedicated hardware and improving the network-awareness of the application with specific optimization for CNs.

The research will be conducted at the Information Engineering and Computer Science department of the university of Trento<sup>4</sup> in the framework of the netCommons project including work with the other project partners and community networks.

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<sup>1</sup> <http://netcommons.eu>

<sup>2</sup> <http://ans.disi.unitn.it>

<sup>3</sup> <http://peerstreamer.org>

<sup>4</sup> <http://disi.unitn.it>

## The Positions

### Research Fellowship:

#### Requirements:

- A PhD in computer science or related subjects. As an alternative, a documented experience of at least three years in research and innovation projects.
  - For those that have a scientific background: a strong publication record in top-tier conferences and journals is required.
  - For those that come from an industrial/development background: a portfolio of documented participation to innovation projects and open source projects participation.
- Since the results will have to be deployed in real networks, strong background in networking and software development is required, with specific reference to at least one between C/C++ and Python competences.
- Fluent spoken and written english (Italian is not required).
- Open mindset, open-source approach and will to work and cooperate with other researchers and with practitioners from community networks.
- Motivation to work in interdisciplinary research.

#### Plus are:

- Skills in Web-programming is a plus.
- Involvement in running open source projects is a plus (better if networking-related, such as in the OpenWRT platform, in any routing protocol development or multimedia-related application).

The contract will be an italian “assegno di ricerca”, net monthly salary will range from 1,800 to 2300 and will be proportioned to the experience of the applicant. **The position is for two years, renewable to a third year.**

The start date is: **ASAP.**

## **PhD position:**

### Requirements:

- Applicants must have a master's degree in Computer Science/Computer Engineering or closely related field, with an emphasis on computer networks.
- A background in :
  - network algorithm/protocol design
  - computer networks (wired and wireless)
  - programming skills (e.g. C/C++, Python)
- Strong skills in oral and written communication.

### Plus are:

- Skills in Web-programming is a plus.
- Involvement in running open source projects is a plus (better if networking-related, such as in the OpenWRT platform, in any routing protocol development or multimedia-related application).

The student will be admitted in the DISI PhD program <http://ict.unitn.it/> (3+1 year program). The next admission call will open in April 2016. The PhD supervisor will be Prof. Renato Lo Cigno.

The official start date for PhDs in Italy is: november 2016. A pre-PhD scholarship can be assigned to admitted students before the official start of the PhD

## About DISI

The Department of Information Engineering and Computer Science (DISI, formerly DIT) was founded in January 2002 and represents a world-class assembly of researchers and institutions. The Department provides a dynamic and qualified response to the ever-increasing, leading-edge competency demands in the field of ICT, drawing from a productive fabric at the local, national and international level.

Some data representing the quality of research at DISI:

- 45 Faculty (average age of 45)
- 91 Research Staff
- 16 Department staff
- 190+ Doctoral Students
- 1200+ Bachelor and Masters Students
- Ranked 2nd best department in Italy for quality of research (ANVUR)<sup>5</sup>
- Received more than 22.000.000 Euros in project funding from 2008 to 2012
- Completed more than 240 projects from 2008 to 2012
- High bibliometric index: 48% has h-index > 20 and 28% has h-index > 30

## About Trento

Trento is a vibrant city with a beautifully preserved historic center, consistently ranked among the best cities for quality of life in Italy. It offers a variety of cultural and sports opportunities all year around, as well as excellent food and wine. The surroundings of Trento offer beautiful naturalistic tracks on top of mountains, around the numerous lakes or nearby ancient castles.

The University website gives you information on the average budget you need to calculate to study, live and enjoy in Trento<sup>6</sup>.

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<sup>5</sup> <http://www.unitn.it/en/ateneo/1684/anvur-report-2013-trento-is-ranked-first-in-italy>

<sup>6</sup> <http://www.unitn.it/en/ateneo/1695/cost-of-living-in-trento>

## How to apply:

Applications should consist of:

- an english resume, specifying if the application is for PhD or for the Research Fellowship
- for the Research Fellowship: a 1-page research statement showing understanding and knowledge on netCommons and PeerStreamer
- up to 3 contacts persons that could act as references.

The applications and any request of information should be sent to: [netcommons@unitn.it](mailto:netcommons@unitn.it)

## References:

For further informations about the project refer to:

- <http://netcommons.eu>

For an overview of the research activities:

- Leonardo Maccari, and Renato Lo Cigno, "Pop-Routing: Centrality-based Tuning of Control Messages for Faster Route Convergence," To appear in the proceedings of the 35th Annual IEEE International Conference on Computer Communications (INFOCOM), April 2016
- Leonardo Maccari, and Renato Lo Cigno, "A week in the life of three large Wireless Community Networks" in AD HOC NETWORKS, v. 24, n. Part B (2015), p. 175-190. - URL: <http://www.sciencedirect.com/science/article/pii/S1570870514001474>
- Luca Baldesi, Leonardo Maccari, and Renato Lo Cigno, "Improving P2P streaming in Wireless Community Networks" in COMPUTER NETWORKS, v. 93, Part 2, (2015), p. 389-403. - URL: <http://www.sciencedirect.com/science/article/pii/S1389128615003448> .
- Maccari, Leonardo; Baldesi, Luca; Lo Cigno, Renato; Forconi, Jacopo; Caiazza, Alessio, "Live Video Streaming for Community Networks, Experimenting with PeerStreamer on the Ninux Community" in Proceedings of the 2015 Workshop on Do-it-yourself Networking: An Interdisciplinary Approach (DIYNetworking '15), proceedings of: MOBISYS/DIYNetworking '15, Florence, Italy, 18 May, 2015. - URL: <http://www.sigmobile.org/mobisys/2015/>