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| Research topics | Radio-assisted image inpainting |
| Position (M/F) | PhD, thesis offer |
| Reference offer | SN/JLD/PHD/Converge/092023 |
| Research Department | Digital Security |
| Publication date | 29/08/2023 |
| Start date | 01/09/2023 |
| Duration | Duration of the thesis |
| Description | |

Wireless communications and computer vision have evolved as separate scientific areas. However, with the advent of new sensor technologies and AI-based signal processing algorithms in both telecommunication and computer vision, new joint studies are now possible [1]. For examples, wireless communications could benefit from visual data to prevent blockage whereas computer vision could gain robustness against occlusions if helped by radio-based imaging.

Within the context of a new European project converge (<https://converge-project.eu/>) whose motto is "communicate to see and see to communicate", EURECOM proposes a PhD position to work on "radio assisted image inpainting" [2]. The objective is to guess what a camera cannot see because of partial (e.g. an object) or total (e.g. wall [3]) occlusions thanks to existing radio/wireless waves attached to WiFi and or 4/5G signals present in the same space. In the opposite way, computer vision can allow to see obstacles that can create problems in the propagation of radio waves [4].

[1] Nishio, T., Koda, Y., Park, J., Bennis, M., & Doppler, K. (2021). When wireless communications meet computer vision in beyond 5G. *IEEE Communications Standards Magazine*, 5(2), 76-83.

[2] Hanyu Xiang, Qin Zou, Muhammad Ali Nawaz, Xianfeng Huang, Fan Zhang, Hongkai Yu, Deep learning for image inpainting: A survey, *Pattern Recognition*, Volume 134, 2023.

[3] Fadel Adib and Dina Katabi. 2013. See through walls with WiFi!. *SIGCOMM Comput. Commun. Rev.* 43, 4 (August 2013), 75-86. DOI: <http://dx.doi.org/10.1145/2534169.2486039>

[4] Charan, G., Alrabeiah, M., & Alkhateeb, A. (2021). Vision-aided 6G wireless communications: Blockage prediction and proactive handoff. *IEEE Transactions on Vehicular Technology*, 70(10), 10193-10208.

Requirements

- Education Level / Degree : Master
- Field / specialty: Signal & Image processing / Artificial Intelligence / Communications

Application

The application must include:

- Detailed curriculum,
- Name and address of 2 references.

Applications should be submitted by e-mail to secretariat@eurecom.fr with the reference: SN/JLD/PHD/Converge/092023



About EURECOM

EURECOM is a major Engineering School and a Research Center in digital sciences founded in 1991 as a consortium in the international technology park of Sophia Antipolis. The IMT is a founding member of the GIE. Teaching and research activities are organized around 3 promising fields: digital security, communication systems and Data Science.

EURECOM has a staff of 150 (researchers and support teams) and welcomes 400 international students on the Campus Sophia Tech, the largest information science and technology campus of the region. EURECOM enjoys a privileged geographical environment on the French Riviera (Côte d'Azur), between sea and mountains, at the heart of a dynamic and multidisciplinary ecosystem that promotes high-level scientific and technological innovation.

Social advantages

- Attractive salary - Corporate saving plans
- Private retirement plan (employer participation of 100%)
- Employee profit sharing policy
- Company health insurance (mutuelle) with high levels of guarantees for the whole family (employer participation of 60%)
- Restaurant vouchers : value 10,50 euros (employer contribution of 60%)

EURECOM has a dynamic policy in terms of inclusion and quality of life at work, committed to diversity and gives the same consideration to all applications, without discrimination.

EURECOM has a "Mission Handicap" policy. All our positions are open to people with disabilities. A designated disability referent welcomes and provide support to employees and students suffering from a disability. He puts in place the necessary arrangements and makes positive commitments in favour of a personalized integration.

EURECOM, as part of its Annual Gender Equality Plan, practices inclusive recruitment without any kind of gender discrimination. The conditions of employment are identical for women and men. In order to promote the diversity in its teams, EURECOM encourages male applications for administrative positions, traditionally occupied by women, and female applications for teaching/research positions, traditionally occupied by men.

EURECOM carries out positive actions within the framework of its CSR policy. A CSR referent steers EURECOM's policy in terms of CSR and energy transition (electric charging stations, solar panels, selective sorting, etc.).