February 2018

Ecole Centrale de Marseille attracts international researchers thanks to European funds with the launch of VisIoN project on Li-Fi technology

VisIoN is a Marie Skłodowska-Curie Innovative Training Network; a joint research training and doctoral program, funded by the EU and implemented by a partnership of high profile universities, research institutions, and non-academic organizations that are located in 7 different countries.

This project aims to train a new generation of early-stage researchers (ESRs) in the emerging area of Visible-Light Communications. The program is structured around 15 Individual Research Projects within 3 main research topics: Smart city and smart home, Smart Transportation and Manufacturing and Medical.

In addition to technical training through PhD courses, dedicated tutorials and workshops organized by the Network, the 15 talented doctoral candidates which have been recruited will benefit from a wide range of complementary non-technical training activities such as entrepreneurship, authoring scientific papers/patents, dissemination, etc.

The participation of industrial partners will further promote research training with commercialization perspectives enabling ESRs to fully integrate theory with hands-on practice.

Lead by Ecole Centrale de Marseille, VISION brings together 10 partners: University of northumbria (United Kingdom), Universidad de las palmas de gran canaria (Spain), Ceske vysoke uceni technicke v praze (Czech Republic), Ozyegin universitesi (Turkey), Fraunhofer gesellschaft zur forderung der angewandten forschung ev (Germany), Instituto de telecomunicacoes (Portugal), Ford otomotiv sanayi anonim sirketi (Turkey), Oledcomm sas (France), Osram gmbh (Germany).

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VisIoN is a European project funded by the European Union's Horizon 2020 research and innovation programme under the Marie Sl odowska-Curie Grant Agreement n° 764461

Press Release

VisIoN for ***Visible light based Interoperability and Networking*** is a Marie Skłodowska-Curie Innovative Training Network; a joint research training and doctoral program, funded by the EU and implemented by a partnership of high profile universities, research institutions, and non-academic organizations that are located in 7 different countries.

The project aims to train a new generation of 15 early-stage researchers (ESRs) in the emerging area of Visible light communication (VLC). Targeted application areas include high speed wireless connection for Internet access or data broadcasting (commonly called Li-Fi*), smart transportation, and medical and manufacturing environments.

The project has started on 1st September 2017. The Vision Kick-off meeting was held on 20 October 2017 at the Institut Fresnel, Marseille, and brought together the 10 partners to plan the actions and in particular to advance the recruitment of future PhD students according to the European procedure foreseen in this type of project.

Supervisory Board, 20 October 2017

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*"**Marie Curie Innovative Training Network** projects are very competitive with around **6%** success rate," says Dr. Ali Khalighi, the Network Scientific Coordinator. "I am very proud of this success; VISION will be the very first Training Network dedicated to the VLC technology and will make significant contributions to the understanding and technical knowhow of this emerging field. The interdisciplinary consortium will work together on both theoretical and practical aspects of VLC with the realization of several proof-of-concept demonstrators."*

Dr. Ali Khalighi is currently an Associate Professor with the Ecole Centrale Marseille and the head of the Telecommunications and Antenna Processing research axis at Fresnel Institute. His main research areas of interest include signal processing for wireless communication systems with an emphasis on the physical layer aspects of free space, underwater, and indoor visible-light optical communications.

Ecole Centrale de Marseille (site Institut Fresnel, Marseille) will welcome 2 young researchers; one of them will work on channel modelling and characterization VLC-based WBANs (Wireless Body Area Networks) and the other one on the development of the full-duplex multiuser VLC networks.

*The DNA of this Marie Curie project, adds **Celine Auger**, Project Manager, is to provide in addition to technical training through PhD courses, dedicated tutorials, and workshops organized by the Network. The ESRs will benefit from a wide range of complementary non-technical training activities such as entrepreneurship, authoring scientific papers/patents, dissemination, etc. The participation of industrial partners will further promote research training with commercialization perspectives enabling ESRs to fully integrate theory with hands-on practice.*

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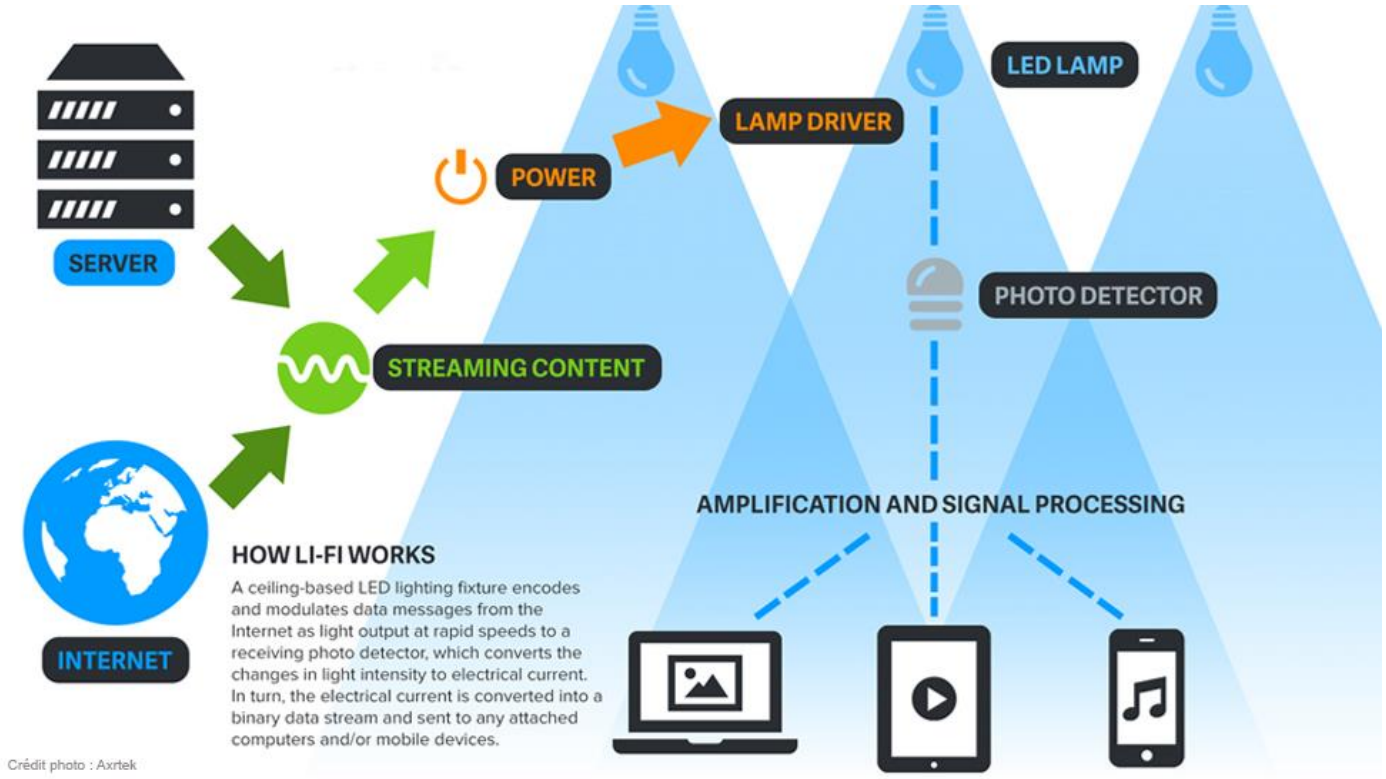
*Li-Fi : contraction of «Light Fidelity» that refers to the Wi-fi (Wireless Fidelity).

With the huge expansion of IoT (Internet of Things) in today's society, a wide variety of issues have been raised, specially concerning wireless communications. Everyday objects (such as in smart home and smart healthcare applications) are now requiring wireless connections. But the conventional radio communication technologies are not always answering to these objects issues (precise geolocation, security issues, etc.). Other problems with these appear: the saturation of the frequency spectrum, the health issues concerning electromagnetic waves overexposure, as well as the always higher required bitrates. The Li-fi (Light Fidelity) can solve some of these issues, but as the young technology it is, more experimentations are required before it becomes a standard.



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European Commission | Horizon 2020 European Union funding for Research & Innovation

Références :
Marie Skłodowska-Curie Actions (MSCA)
Innovative Training Networks (ITN)
H2020-MSCA-ITN-2017

VisIoN - Innovative Training Networks (ITN) - Marie Skłodowska-Curie Actions (MSCA)

Key Figures

Budget: **3,75M€**

Duration: **48 months**

Leader: **Ecole Centrale de Marseille**

Scientific Coordinator: Ali Khalighi, Associate Professor, Ecole Centrale de Marseille.

10 partners:

5 Academic Partners: Ecole centrale Marseille (site Institut Fresnel, France), University of northumbria (United Kingdom), Universidad de las palmas de gran canaria (Spain), Ceske vysoke uceni technicke v praze (Czech Republic), Ozyegin universitesi (Turkey)

2 Research Instituts: Fraunhofer gesellschaft zur forderung der angewandten forschung ev (Germany), Instituto de telecomunicacoes (Portugal)

3 Industrial partners: Ford otomotiv sanayi anonim sirketi (Turkey), Oledcomm sas (France), Osram gmbh (Germany)

And associated partners: Lightbee (Spain), Network Rail (United Kingdom), Philips (Netherlands) and SQS Vlaknova Optika (Czech Republic)

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To know more

To know more about Marie Skłodowska-Curie actions:
The Marie Skłodowska-Curie actions, named after the double Nobel Prize winning Polish-French scientist famed for her work on radioactivity, support researchers at all stages of their careers, irrespective of nationality. Researchers working across all disciplines, from life-saving healthcare to 'blue-sky' science, are eligible for funding. The MSCA also support industrial doctorates, combining academic research study with work in companies, and other innovative training that enhances employability and career development.
http://ec.europa.eu/research/mariecurieactions/

To know more about Ecole Centrale de Marseille:
The Ecole Centrale Marseille offers a generalist engineering study programme designed to correspond to changes in the profession of engineer and needs for engineering skills. During their studies, Centrale Marseille students are given training in a solid and wide range of scientific and technical skills. They will learn about the complexity of technological systems, the management of companies and the profession of engineer through a study programme designed by and for enterprise (courses, projects, internships). They are trained in communications skills and teamwork while benefiting from excellent opportunities for understanding international business. They are encouraged to take control of their personal development through involvement in a wide range of associations and other activities.
https://www.centrale-marseille.fr/en

To know more about Institut Fresnel:
Institut Fresnel is located on the Etoile campus in Marseille. The teams work on four fields: electromagnetism and metamaterials, nanophotonics and optical components, information processing and random waves and advanced imaging and life sciences.
http://www.fresnel.fr/spip/?lang=fr

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www.fresnel.fr

H2020 MSCA ITN Project: VisIoN "European Training Network on Visible light based Interoperability and Networking"

Ali KHALIGHI, Céline AUGER
Aix Marseille Univ, CNRS, Centrale Marseille, Institut Fresnel, 13013 Marseille, France

Context : New generations of LEDs have attractive features such as a long life expectancy, lower power consumption and reduced heat dissipation. In line with governmental plans worldwide, it is predicted that LEDs will be the ultimate light source in the near future. Besides indoor illumination, LEDs are being widely used in street lighting, traffic signs, advertising displays, transportation, etc. Visible light communication (VLC) is one of the most promising current areas of research with a significant potential for high-impact results and successful outcomes might revolutionize utilization of LEDs for modern infrastructures to add novel functionalities in addition to illumination. VLC has been proposed for smart homes and streets, manufacturing and medical environments for increased data security and reduced interference, or a two-way vehicle-to-vehicle and vehicle-to-roadside infrastructure communications as part of the emerging intelligent transportation systems for increasing road safety.

Objectives : This project aims to train a new generation of early-stage researchers (ESRs) in the emerging area of VLC. Through research on co-supervised individual projects focusing on selected applications, VisIoN will make significant contributions to the fundamental scientific understanding and technical knowhow. Targeted application areas include indoor and outdoor VLC access, smart transportation, and medical and manufacturing environments. In addition to technical training through PhD courses, dedicated tutorials, and workshops organized by the Network, the ESRs will benefit from a wide range of complementary non-technical training activities such as entrepreneurship, authoring scientific papers/patents, dissemination, etc. The participation of industrial partners will further promote research training with commercialization perspectives enabling ESRs to fully integrate theory with hands-on practice.

3 Research Topics

Smart Cities, Offices, and Homes

VLC augments RF based technologies in indoor and outdoor communications. In smart cities, where everything will be connected, the communication networks must offer higher speed, high reliability, high availability, low latency and the new requirements of Internet-of-Things.

Smart City

Smart Transportation

LEDs are widely used in traffic signs, advertising displays, transportation, streetlights, etc. VLC is proposed for two-way vehicle-to-vehicle (V2V) and vehicle-to-infrastructure (V2I) communications to reduce the number of casualties, increase safety, improve traffic efficiency and introduce autonomous driving, as well as providing high-speed Internet access within cars, trains, airplanes, etc.

Smart Transport

Manufacturing and Medical

VLC exploits its unique potential of not being jammed by RF signals, very limited interference with other devices, and offering total security of protecting data. With the use of MIMO architectures, VLC can offer high reliability and robustness and with its inherently high bandwidth it can address low latency requirements.

Manufacturing & Smart healthcare

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Key points

3,75 M€ - 48 months - 10 partners - 7 countries

5 Academic partners : Ecole Centrale Marseille (Marseille, France), Northumbria University (Newcastle, United Kingdom), Czech Technical University (Prague, Czech Republic), University of Las Palmas (Gran Canaria, Spain), Ozyegin University (Istanbul, Turkey)

2 Research Institutes : Fraunhofer Heinrich Hertz Institute (Berlin, Germany), Institute for Telecommunications (Aveiro, Portugal)

3 Industrial Partners : OSRAM Gmbh (Germany), Oledcomm SAS (France), Ford OTOSAN (Turkey)

Supporting Industries : LightBee (Spain), Network Rail (UK), Philips (Netherlands), SQS Vlaknová Optika (Czech Republic)

Next Rendez-Vous VisIoN !

First training school in Budapest, Hungary, **July 2018**

Second training school in Gran Canaria, Spain, **January 2019**

Check out our website : **www.vision-itn.eu**

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