Working Group 2, Milestone 2.3

System Implementation and Experimental Evaluation

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Introduction

In the NEWFOCUS working group 2, the optical wireless range was defined in the order of magnitude of meters. Consequently, the large majority of the work can be found in the realm of indoor environments. In the first year and a half of this project, multiple input documents created by the members of this action and publications acknowledging NEWFOCUS can be classified under the "System Implementation and Experimental Evaluation" umbrella.
Below, we have created an overview of the input documents and publications that fill within this classification. The high number of input documents and publications demonstrate clearly that the milestone is reached.

Input documents

- "Design of heterogeneous OWC/RF networks", by Gordana Gardašević, Jovan Galić, Milan Mlađen, University of Banja Luka, Faculty of Electrical Engineering, Patre 578000 Banja Luka, Bosnia and Herzegovina.
- "Implementation of a VLP Infrastructure in a Representative Industrial Environment", by Willem Raes, Glenn Groothuis, Jorik De Bruycker and Nobby Stevens, WaveCore, ESAT, KU Leuven, Belgium.
- "CMOS camera as optical real-time oscilloscope", by Lorenzo Gilli, Giulio Cossu, Ernesto Ciaramella.
- "An Intelligent Smartphone to Smartphone Visible Light Communication System" by Vaigai Nayaki Yokar, Hoa-Le-Minh, Zabih Ghassemlooy, Wai Lok Woo.
- "A 40 Mb/s VLC System Reusing an Existing Large LED Panel in an Indoor Office Environment" by Xicong Li, Zabih Ghassemlooy, Stanislav Zvanovec and Paul Anthony Haigh;Optical Communications Research Group, Faculty of Engineering and Environment, Northumbria University, Newcastle upon Tyne, NE1 8ST, UK; ; Department of Electromagnetic Field, Faculty of Electrical Engineering, Czech Technical University in Prague, Prague, Czech Republic; Intelligent Sensing and Communications Group, School of Engineering, Newcastle University, Newcastle upon Tyne, NE1 7RU, UK.
- "The Utilization of Artificial Neural Network Equalizer in Optical Camera Communications" by Othman Isam Younus,Navid Bani Hassan, Zabih Ghassemlooy, Stanislav Zvanovec, Luis Nero Alves and Hoa Le-Minh; Optical Communications Research Group, Faculty of Engineering and Environment, Northumbria University, Newcastle upon Tyne NE1 8ST, UK;; Institute of Photonics, University of Strathclyde, Glasgow G1 1XQ, UK;;Department of Electromagnetic Field, Faculty of Electrical Engineering, Czech Technical University in Prague, 16627 Prague, Czech Republic;; Instituto de Telecomunicações and Departamento de Electrónica, Telecomunicações e Informática, Universidade de Aveiro, 3810-193 Aveiro, Portugal.
- "Hybrid POF/VLC links based on a single LED for indoor communications" by Juan A. Apolo, Beatriz Ortega and Vicenç Almenar ; Instituto de Telecomunicaciones y Aplicaciones Multimedia, ITEAM, Universitat Politècnica de València, Camino de Vera, 46022 Valencia, Spain.
- "Interfacing MIL-STD-1553 bus to Optical Wireless System";Lorenzo Gilli, Giulio Cossu, Ernesto Ciaramella.
- "Transmitter Identification Using Frame Reconstruction in Rolling Shutter Based Systems"; Miguel Rêgo, Pedro Fonseca, Luís Nero Alves
- "Optical Characterization of Materials"; P. Combeau, L. Aveneau, P. Thuillier Le Gac, and R. Xiao.

- “Speech signal quality assessment in visible light communication”; Jovan Galić, Gordana Gardašević, Boris Malčić.
- Lorenzo Gilli, Giulio Cossu, Ernesto Ciaramella “Optical Wireless System for Intra-Spacecraft Data Transmission”;Scuola Superiore Sant’Anna.
- Joaquin Perez Soler, Luis Miguel Giraldo Salazar, Alejandro Sánchez Ruano, Miguel Rêgo, Carmen Botella-Mascarell, Sandra Roger Varea, Vicent Girbes Juan, Luis Nero Alves, Julio Martos Torres; “A New Test-Bed for Optical Wireless Communication and Optical Camera Communication for IoT Applications based on LED-panel luminaries”; Universitat de València , Université de Franche-Comté, Instituto de Telecomunicações, Aveiro , Escola Tècnica Superior d’Enginyeria, Universitat de València.
- B. Bademci, A. Nismy, N. Stevens, S. Dudley, M. T. Sajjad, “Self-Powered Organic Photodiodes Receivers in Visible Light Communication Systems”; London South Bank University , KU Leuven.
- Sreelal Maravanchery Mana, Sepideh Mohammadi Kouhini, Malte Hinrichs, Dominic Schulz, Ronald Freund, Volker Jungnickel , “LIDAR assisted channel modelling for LiFi”; Fraunhofer Heinrich-Hertz-Institute.
- Elena Aparicio-Esteve, Jesús Urena, Álvaro Hernaández, David Moltó, José M. Villadangos, Miguel Cubero, “Centralized Optical 3D Positioning System for Emitting Tags”; Electronics Department, University of Alcala, Alcala de Henares, Spain.
- Mehmet Cagri Ilter, Alexis A. Dowhuszko, and Mikko Valkama “Data-oriented design of radio-optical wireless communication networks for time-sensitive networking in industrial applications”; Faculty of Information Technology and Communication Sciences, Tampere University, Finland; Department of Information and Communications Engineering, Aalto University, Finland.
- Jovan Galić, Milan Mlađen, Gordana Gardašević, Milica Petković, Boris Malčić, Slavko Šajić “A Study on Audio Signal Quality Assessment in Visible Light Communication”;University of Banja Luka, Faculty of Electrical Engineering, Patre 5, 78000 Banja Luka, Bosnia and Herzegovina; Department of Power, Electronic and Telecommunication Engineering, University of Novi Sad, Faculty of Technical Sciences, Trg Dositeja Obradovića 6, Novi Sad, 21102, Serbia.
- Valeria Loscri, Mauro Biagi “LIBERO: LIght Bias as effective countermeasure against EavesdROpper attacks”; FUN Team of Inria Lille, France; Department of Information, Electrical, and Telecommunication (DIET) engineering, “Sapienza” University of Rome, Italy.
- J.A Apolo, I. O. Osahon, B Ortega, V Almenar, S. Rajbhandari, J. Tang “Experimental Demonstration of High-Precision 3D/2D Indoor Visible Light Positioning using an Imaging Receiver”; Instituto de Telecomunicaciones y Aplicaciones Multimedia, (ITEAM), Universitat Politècnica de València, Spain; DSP Centre of Excellence, School of Computer Science and Electronic Engineering, Bangor University, U.K.; Institute of Photonics, University of Strathclyde, U.K..
- Eleni Niarchou, Klara Eollos-Jarosikova, Vicente Matus, Rafael Perez-Jimenez, Stanislav Zvanovec, Matej Komanec, Jose Rabadan “Experimental Evaluation of Wearable LED Strip and Side-Emitting Fiber for Optical Camera Communications Systems”; Institute for Technological Development and Innovation in Communications, University of Las Palmas de Gran Canaria, Las Palmas de Gran Canaria, 35001, Spain; Department of Electromagnetic Field, Faculty of Electrical Engineering, Czech Technical University in Prague, Prague, 16627, Czech Republic.
- Ognjen Kundacina, Milica Petkovic, Andrea Munari, Dejan Vukobratovic, Leonardo Badia “Move Away From Me! User Repulsion Under Proximity-Induced Interference in OWC Systems”;Institute for Artificial Intelligence Research and Development of Serbia, Novi Sad, Serbia; University of

Novi Sad, Faculty of Technical Sciences, Novi Sad, Serbia; Institute of Communications and Navigation of the German Aerospace Center (DLR), Wessling, Germany; University of Padova, Italy.

- Dimitrios Bozanis, Nikos G. Evgenidis, Vasilis K. Papanikolaou, Pavlos S. Bouzinis, Sotiris A. Tegos, Alexis A. Dowhuszko, Panagiotis D. Diamantoulakis, and George K. Karagiannidis "Indoor 3D Visible Light Positioning Analysis with Channel Estimation Errors"; Wireless Communications and Information Processing Group (WCIP), Department of Electrical and Computer Engineering, Aristotle University of Thessaloniki, Thessaloniki 54124, Greece; Institute for Digital Communications (IDC), Friedrich-Alexander Universitat Erlangen-Nurnberg (FAU), Germany; Department of Information and Communications Engineering (DICE), Aalto University, 02150 Espoo, Finland; Artificial Intelligence & Cyber Systems Research Center, Lebanese American University (LAU), Lebanon.
- Konstantinos Rallis, "Software-defined implementation of distributed MIMO precoding for optical wireless access".
- "Optical Coded GSSK with Physical Layer Security in the Presence of Dimming";Sumeyra Hassan;Aldemir Electronics Engineering Kadir Has University, Istanbul ; Erdal Panayirci Electronics Engineering, Kadir Has University, Istanbul, Turkiye ;Tor Helleseth Department of Informatics, Bergen University, Bergen, Norway;H. Vincent Poor, Electrical and Computer Engineering, Princeton University, New Jersey, USA.
- "Data-oriented design of radio-optical wireless communication networks in smart factory environments";Mehmet Cagri Ilter, Alexis A. Dowhuszko, and Mikko Valkama.
- "Visible-Light Indoor Positioning with Arduino Signal Processing"; S. Macrì, L. Foucher, G. Cossu, L. Gilli, N. Vincenti, and E. Ciaramella.
- "Precision Assessment of Pulsed Optical Wireless Time Difference of Arrival Estimation;"Jorik De Bruycker;Shivani Rajendra Teli;Stanislav Zvanovec;Zabih Ghassemlooy;Lieven De Strycker;François Rottenberg; Nobby Stevens.

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