

Marco Zennaro

Curriculum Vitae

Education

- 2010 **PhD in Telecommunications**, *KTH – the Royal Institute of Technology*, Stockholm, Sweden.
- 2001 **Master in Electronical Engineering**, *University of Trieste*, Trieste, Italy.

PhD Thesis

- Title *Wireless Sensor Networks for Development: Potentials and Open Issues*
- Supervisor Prof. Bjorn Pehrson
- Abstract Wireless Sensor Networks (WSNs) provide a way to bridge the gap between the physical and the virtual worlds. They promise unprecedented abilities to observe and understand large-scale, real-world phenomena at a fine spatial-temporal resolution. Their application in Developing Countries is even more interesting: they can help solve problems that affect communities.

Research Interests

- ICT4D My research interests are in the area of **ICT4D**. More specifically, I focus on IoT, wireless sensor networks and their applications in Developing Countries. The use of wireless sensor networks in developing regions has a great role to play not only to expedite novel solutions that help mitigate development problems, but also to facilitate research activities in crucial scientific areas such as environmental monitoring, physics of complex systems and energy management.

Experience

- 2002–Present **ICTP**, *Trieste, Italy*.
I work as a Research Officer in the T/ICT4D Laboratory of the Applied Physics Unit. Over the years I have taken more responsibilities: managing projects with external partners, organizing workshops as main organizer, supervising STEP and TRIL visitors, working with ICTP Associates and managing the group's budget.
- 2002 **EPFL**, *Lausanne, Switzerland*.
I worked as a Research Assistant in the Microelectronic System Laboratory in the field of Digital Design
- 2001 **Infineon**, *Villach, Austria*.
I worked on my Master Thesis "VHDL Design of a DMA for a DSP"

Outreach

2002–Present **Workshops in 35 Countries.**

I have organized workshops and lectured in activities in: Ghana, Kenya, Cameroon, India, Benin, Namibia, South Africa, Indonesia, Thailand, Trinidad, Hong Kong, Taiwan, Tunisia, Senegal, Zambia, Zimbabwe, Lesotho, Japan, Micronesia, Malawi, Mozambique, Rwanda, Bolivia, Argentina, Mauritius, Seychelles, Ecuador, Panama, Nicaragua, Costa Rica, Comoros, Colombia, Nepal, Uganda and Myanmar.

2019 **ITU Centre of Excellence at ICTP.**

I serve as the Focal Point for the ITU Centre of Excellence in IoT, Big Data and Statistics.

2017 **ITU IoT Master Programme.**

I served as author of the report for the ITU IoT Master Programme and as coordinator for the production of training material for the ITU IoT Master Programme.

Student supervision

2019– **Irene Mihigo**, *PhD*, ACoEIoT, Rwanda.

2018– **Joseph Habiyaremye**, *PhD*, ACoEIoT, Rwanda.

2018– **Martin Kuradusenge**, *PhD*, ACoEIoT, Rwanda.

2018– **Salahadin Seid Musa**, *PhD*, Addis Ababa University, Ethiopia.

2019–2020 **Phila Ngarleita Danmadji**, *Master*, IMSP, Benin.

Implementation de la blockchain pour les applications IoT

2019–2020 **Sidoine Ode**, *Master*, IMSP, Benin.

Systeme de surveillance d'un reseau sans fil: Cas du Wi-Fi du Campus de Dangbo

2011 **Mayamiko Nkoloma**, *Master*, I2IT, India.

Remote Monitoring of Renewable Energy Systems Deployed in Malawi

2009 **Athanasios Floros**, *Master*, KTH, Sweden.

Routing Protocols for SunSPOTs - Analysis, Comparison and Implementation of a new one

2008 **Loris Segolin**, *Master*, University of Trieste, Italy.

On the optimal placement of Access Points

2008 **Herve' Ntareme**, *Master*, KTH, Sweden.

Experimental evaluation of Temporal, Spatial and Energy characteristics of an Outdoor Sensor Network

2006 **Marco Liva**, *Master*, University of Trieste, Italy.

Design of a Point-to-Point HF Data Transmission System

ICTP Service

STEP and TRIL I supervised two STEP students (Nikola Jovalekic and Salahadin Seid Musa) and trained several TRIL fellows, supervising their scientific work.

Associates I worked with the following Associates: Bharat Chaudhari (India), Antoine Bagula (South Africa), Diego Mendez Chaves (Colombia), Chomora Mikeka (Malawi), Salomao David Cumbula (Mozambique), Hiba Baha Eldin Sayed Omer (Saudi Arabia) and Rodrigo Neumann (Brazil).

Projects

- UN I managed joint projects with several UN agencies: with UNECA (UN Economic Commission for Africa) on providing connectivity to weather stations in African Islands, with ITU (International Telecommunications Union) on developing a wireless training kit, with UNESCO on developing a wireless training kit and on editing a book on open access and with IAEA on developing low cost sensors for radiation monitoring.
- EU I worked on two EU projects: FP7 "Clommunity: A Community Networking Cloud in a Box" and FP7 "QWeCl: Quantifying Weather and Climate Impacts on Health in Developing Countries". In 2018 and 2019 I acted as external expert for a EU H2020 project on IoT in Africa.
- ACoEIoT I am a Staff Associate of the African Centre of Excellence in Internet of Things project at University of Rwanda since its inception.

Awards

- 2017 I have been nominated IEEE Senior Member.
- 2015 I have been nominated Visiting Professor at KIC-Kobe Institute of Computing in Kobe, Japan. I visit KIC every year to lecture on IoT4D.
- 2013 I have been nominated Sensemaking Senior Research Fellow of the MIT International Development Initiative.
- 2004 I am a member of the UNESCO Chair in ICT4D which grew out of the ICT4D Collective.

Languages

- English **Excellent**
- Italian **Mothertongue**
- French **Intermediate**

Books

I co-edited with ICTP Associate Bharat Chaudhari the book "LPWAN Technologies for IoT and M2M Applications", ISBN 978-0-12-818880-4, Elsevier, 2020.

I co-edited the book "IoT in Five Days", 2015. The book has been translated in French and Spanish with the support of the Internet Society (ISOC).

I co-edited the book "TV White Spaces, a pragmatic approach" (<http://wireless.ictp.it/tvws/book/>), 2013.

I co-edited the book "m-Science: Sensing, Computing and Dissemination", 2010.

I co-edited the book "Science Dissemination using Open Access" (<http://sdu.ictp.it/openaccess/book.html>), 2008.

I co-edited the book "How To Accelerate Your Internet: A practical guide to Bandwidth Management and Optimisation using Open Source Software", 2006.

I co-authored the book Wireless Networking in the Developing World (<http://www.wndw.net>), 2005. The book has been translated in six languages (French, Spanish, Portuguese, Arabic, Indonesian, Burmese) and has been downloaded more than 3 million times.

Journal Articles

Bharat S Chaudhari, Marco Zennaro, and Suresh Borkar. "LPWAN Technologies: Emerging Application Characteristics, Requirements, and Design Considerations". In: *Future Internet* 12.3 (2020), p. 46.

Sheetal N Ghorpade, Marco Zennaro, and Bharat S Chaudhari. "GWO Model for Optimal Localization of IoT-Enabled Sensor Nodes in Smart Parking Systems". In: *IEEE Transactions on Intelligent Transportation Systems* (2020).

Pape Abdoulaye Barro et al. "A Smart Cities LoRaWAN Network Based on Autonomous Base Stations (BS) for Some Countries with Limited Internet Access". In: *Future Internet* 11.4 (2019), p. 93.

Angelica Moreno Cardenas et al. "A Low-Cost and Low-Power Messaging System Based on the LoRa Wireless Technology". In: *Mobile Networks and Applications* (2019), pp. 1–8.

Sheetal N Ghorpade, Marco Zennaro, and Bharat S Chaudhari. "Binary grey wolf optimisation-based topology control for WSNs". In: *IET Wireless Sensor Systems* 9.6 (2019), pp. 333–339.

Pape Barro et al. "Towards Smart and Sustainable Future Cities Based on Internet of Things for Developing Countries: What Approach for Africa?" In: *EAI Endorsed Transactions on Internet of Things* 4.13 (2018).

Riccardo Gerin et al. "On the design of a sustainable ocean drifter for developing countries". In: *EAI Endorsed Transactions on Internet of Things* 4.13 (2018).

Nikola Jovalekic et al. "Experimental study of LoRa transmission over seawater". In: *Sensors* 18.9 (2018), p. 2853.

Nikola Jovalekic et al. "LoRa transceiver with improved characteristics". In: *IEEE Wireless Communications Letters* 7.6 (2018), pp. 1058–1061.

Marco Zennaro and Santhi Kumaran. "Capacity building initiatives in IoT in developing countries: lessons learned and way forward". In: *Capacity Building in a Changing ICT Environment 2018* (2018), pp. 29–36.

Jose Saldana et al. "Alternative networks: Toward global access to the internet for all". In: *IEEE Communications Magazine* 55.9 (2017), pp. 187–193.

Jorge E Luzuriaga et al. "Evaluando un escenario de pruebas para el IoT entre la emulación y el uso de dispositivos reales". In: *Actas Jornadas Sarteco* (2016), pp. 441–445.

Hope Mauwa, Antoine Bagula, and Marco Zennaro. "Improving Spectrum Sensing as a Method for White Space Identification through Design Principles". In: *Journal of ICT Standardization* 3.3 (2016), pp. 177–200.

Junaid Qadir et al. "Wireless technologies for development [Guest Editorial]". In: *IEEE Communications Magazine* 54.7 (2016), pp. 18–19.

Antoine Bagula, Lorenzo Castelli, and Marco Zennaro. "On the design of smart parking networks in the smart cities: An optimal sensor placement model". In: *Sensors* 15.7 (2015), pp. 15443–15467.

Salomão David, Marco Zennaro, and Américo Muchanga. "The Internet@ rural: why not TV-White spaces in Mozambique?" In: *Privilege, Information, Knowledge and Power: An Endless Dilemma* 7 (2015), p. 28.

Roman Lara et al. "On real-time performance evaluation of volcano-monitoring systems with wireless sensor networks". In: *IEEE Sensors Journal* 15.6 (2015), pp. 3514–3523.

Enrique Canessa et al. "EyApp & AndrEyA–Free Apps for the Automated Recording of Lessons by Students." In: *International Journal of Emerging Technologies in Learning* 9.1 (2014).

Chomora Mikeka et al. "Preliminary performance assessment of TV white spaces technology for broadband communication in Malawi". In: *Procedia Engineering* 78 (2014), pp. 149–154.

C Mikeka et al. "Malawi television white spaces (TVWS) pilot network performance analysis". In: *Journal of Wireless Networking and Communications* 4.1 (2014), pp. 26–32.

Sindiso M Nleya et al. "Optimisation of a TV white space broadband market model for rural entrepreneurs". In: *Journal of ICT Standardization* 2.2 (2014), pp. 109–128.

Clement Onime, Marco Zennaro, and James Uhomoibhi. "A low cost implementation of an existing hands-on laboratory experiment in electronic engineering". In: *International Journal of Engineering Pedagogy (iJEP)* 4.4 (2014), pp. 4–7.

Dhirendra Sharma, Vikram Kumar, and Marco Zennaro. "Ubiquitous Wireless Sensor Networks for Environmental Monitoring in the Western Himalayan Region of India". In: *International Journal* 4.3 (2014).

Enrique Canessa et al. "Apps for synchronized photo-audio recordings to support students". In: *Proc. WAVE* 2013 (2013).

Enrique Canessa et al. "Low-cost 3D printing for science, education and sustainable development". In: *Low-Cost 3D Printing* 11 (2013).

Roman Lara et al. "Towards a new volcano monitoring system using wireless sensor networks". In: *Intelligent Sensors Sensor Networks and Information Processing (ISSNIP)* (2013).

Million Mafuta et al. "Successful deployment of a wireless sensor network for precision agriculture in Malawi". In: *International Journal of Distributed Sensor Networks* 9.5 (2013), p. 150703.

Antoine Bagula et al. "Ubiquitous sensor networking for development (usn4d): An application to pollution monitoring". In: *Sensors* 12.1 (2012), pp. 391–414.

Enrique Canessa, Carlo Fonda, and Marco Zennaro. "On-line certification for all: the Pinvox algorithm". In: *International Journal of Emerging Technologies in Learning (iJET)* 7.3 (2012), pp. 43–45.

Enrique Canessa and Marco Zennaro. "A mobile science index for development". In: *International Journal of Interactive Mobile Technologies (iJIM)* 6.1 (2012), pp. 4–6.

Sandro Radicella, Ryszard Strużak, and Marco Zennaro. "Educating on Wireless Solutions for Environmental Monitoring". In: *Journal of Telecommunications and Information Technology* (2012), pp. 78–82.

Antoine Bagula et al. "Bridging the digital divide in Africa: A technology perspective". In: *Wireless Communication and Information* (2011), pp. 7–28.

Antoine B Bagula, Isaac Osunmakinde, and Marco Zennaro. "On the relevance of using Bayesian belief networks in wireless sensor networks situation recognition". In: *Sensors* 10.12 (2010), pp. 11001–11020.

Marco Zennaro and Antoine B Bagula. "Design of a flexible and robust gateway to collect sensor data in intermittent power environments". In: *International Journal of Sensor Networks* 8.3-4 (2010), pp. 172–181.

Antoine B Bagula et al. "On the relevance of using openwireless sensor networks in environment monitoring". In: *Sensors* 9.6 (2009), pp. 4845–4868.

Enrique Canessa, Carlo Fonda, and Marco Zennaro. "One year of ICTP diploma courses on-line using the automated EyA recording system". In: *Computers & Education* 53.1 (2009), pp. 183–188.

Enrique Canessa, Marco Zennaro, and Carlo Fonda. "Supporting science in developing countries using open technologies". In: *European journal of physics* 30.3 (2009), p. 651.

Waldir Roque et al. "Tecnologia EyA: uma ferramenta para produção e difusão automatizada de aulas digitais na web". In: *RENTE-Revista Novas Tecnologias na Educação* 6.1 (2008).

E Canessa, C Fonda, and M Zennaro. "Webcasting of traditional chalkboard lectures: the EyA system". In: *European Journal of Open, Distance and E-learning* 10.2 (2007).

Marco Zennaro et al. "Book Sprint: A New Model for Rapid Book Authoring and Content Development". In: *International Journal of the Book* 4.1 (2007).

Enrique Canessa et al. "A web community to foster science in developing countries: www. ictp. it". In: *International Journal of Web Based Communities* 2.2 (2006), pp. 172–182.

Enrique Canessa et al. "Access to scholarly literature via a free knowledge management enabler: an opportunity for scientists in developing countries". In: *Knowledge Management for Development Journal* 2.3 (2006), pp. 75–85.

Katepalli Sreenivasan et al. "Access to scholarly literature via a free knowledge management enabler: An opportunity for scientists in developing countries". In: (2006).

M Zennaro et al. "Scientific measure of Africa's connectivity". In: *Information Technologies & International Development* 3.1 (2006), pp–55.

Book Chapters

Anjali Askhedkar, Bharat Chaudhari, and Marco Zennaro. "Hardware and software platforms for low-power wide-area networks". In: *LPWAN Technologies for IoT and M2M Applications*. Academic Press, 2020, pp. 397–407.

Anjali Askhedkar et al. "TV white spaces for low-power wide-area networks". In: *LPWAN Technologies for IoT and M2M Applications*. Academic Press, 2020, pp. 167–179.

Bharat S Chaudhari and Marco Zennaro. "Introduction to low-power wide-area networks". In: *LPWAN Technologies for IoT and M2M Applications*. Academic Press, 2020, pp. 1–13.

Bharat Chaudhari and Marco Zennaro. "LoRa Transmission Over Rayleigh Fading Channels in Presence of Interference". In: *Innovations in Electronics and Communication Engineering*. Springer, Singapore, 2020, pp. 185–192.

Antoine B Bagula, Mieso K Denko, and M Zennaro. "Middleware for Mobile and Pervasive Services". In: *Handbook of Mobile Systems Applications and Services*. Vol. 7. CRC Press, 2012, pp. 246–265.

Conference Papers

Steve Chan et al. "The Blindspot of Electromagnetic Interference Affecting Sensitive Medical Devices at Hospitals and Healthcare Facilities". In: *2020 10th Annual Computing and Communication Workshop and Conference (CCWC)*. IEEE. 2020, pp. 0449–0457.

Marco Zennaro et al. "Evaluating the performance of NRENs in deploying IoT in Africa: the case for TTN". In: *2020 IEEE 17th Annual Consumer Communications & Networking Conference (CCNC)*. IEEE. 2020, pp. 1–4.

Pape Abdoulaye Barro, Marco Zennaro, and Jules Degila. "A LoRaWAN Coverage Testbed and a Multi-optional Communication Architecture for Smart City Feasibility in Developing Countries". In: *International Conference on e-Infrastructure and e-Services for Developing Countries*. Springer, Cham. 2019, pp. 73–83.

Pape Abdoulaye Barro, Marco Zennaro, and Ermanno Pietrosemoli. "TLTN—The local things network: on the design of a LoRaWAN gateway with autonomous servers for disconnected communities". In: *2019 Wireless Days (WD)*. IEEE. 2019, pp. 1–4.

Salomão David, Ermanno Pietrosimoli, and Marco Zennaro. "Evaluation of IoT gateways for developing communities: smart Maputo". In: *Proceedings of the Tenth International Conference on Information and Communication Technologies and Development*. 2019, pp. 1–5.

M Marcelli et al. "OpenMODs project: advancing toward the widespread application of low-cost technologies in coastal ocean observing." In: *OCEAN OBS '19, An Ocean of Opportunity, Hawaii Convention Center, Honolulu, HI, USA, 16 September 2019 - 20 September 2019*. 2019.

Ermanno Pietrosimoli, Marco Rainone, and Marco Zennaro. "On Extending the Wireless Communications Range of Weather Stations using LoRaWAN". In: *Proceedings of the 5th EAI International Conference on Smart Objects and Technologies for Social Good*. 2019, pp. 78–83.

Angelica Moreno Cardenas et al. "A LoRa enabled sustainable messaging system for isolated communities". In: *Proceedings of the 4th EAI International Conference on Smart Objects and Technologies for Social Good*. 2018, pp. 118–123.

Salomão David, Américo Muchanga, and Marco Zennaro. "The Co-Regulation of TV-White Spaces: The Southern Africa Development Community Approach". In: *International Conference on Cross-Cultural Design*. Springer, Cham. 2018, pp. 286–297.

Jorge Herrera-Tapia et al. "Evaluating the use of sub-gigahertz wireless technologies to improve message delivery in opportunistic networks". In: *2017 IEEE 14th International Conference on Networking, Sensing and Control (ICNSC)*. IEEE. 2017, pp. 305–310.

Nikola Jovalekic et al. "Smart and very distant objects". In: *Proceedings of the 3rd Workshop on Experiences with the Design and Implementation of Smart Objects*. 2017, pp. 29–34.

Jorge E Luzuriaga et al. "A disruption tolerant architecture based on MQTT for IoT applications". In: *2017 14th IEEE Annual Consumer Communications & Networking Conference (CCNC)*. IEEE. 2017, pp. 71–76.

Antoine Bagula et al. "Cloud based patient prioritization as service in public health care". In: *2016 ITU Kaleidoscope: ICTs for a Sustainable World (ITU WT)*. IEEE. 2016, pp. 1–8.

Salomão David et al. "TV-White Spaces for Education: The Internet for Education in Boane". In: *Conference on M4D Mobile Communication Technology for Development*. 2016, p. 265.

Hope Mauwa et al. "Systematic analysis of geo-location and spectrum sensing as access methods to TV white space". In: *2016 ITU Kaleidoscope: ICTs for a Sustainable World (ITU WT)*. IEEE. 2016, pp. 1–8.

Md Nazmus Sakib Miazi et al. "Enabling the Internet of Things in developing countries: Opportunities and challenges". In: *2016 5th International Conference on Informatics, Electronics and Vision (ICIEV)*. IEEE. 2016, pp. 564–569.

Andres Arcia Moret et al. "Open and regionalised spectrum repositories for emerging countries". In: *Proceedings of the 2016 workshop on Global Access to the Internet for All*. 2016, pp. 13–18.

Ermanno Pietrosemoli et al. "BLOP: Broadband Link to an Offshore Platform in the Venice Lagoon". In: *ExtremeCom 2016*. 2016.

Marco Rainone, Marco Zennaro, and Ermanno Pietrosemoli. "RFTrack: a tool for efficient spectrum usage advocacy in Developing Countries". In: *Proceedings of the Eighth International Conference on Information and Communication Technologies and Development*. 2016, pp. 1–4.

Marco Zennaro, Marco Rainone, and Ermanno Pietrosemoli. "Radio link planning made easy with a telegram bot". In: *International Conference on Smart Objects and Technologies for Social Good*. Springer, Cham. 2016, pp. 295–304.

Roger Baig et al. "Deploying clouds in the Guifi community network". In: *2015 IFIP/IEEE International Symposium on Integrated Network Management (IM)*. IEEE. 2015, pp. 1020–1025.

Roger Baig et al. "The Cloudy distribution in community network clouds in Guifi. net". In: *2015 IFIP/IEEE International Symposium on Integrated Network Management (IM)*. IEEE. 2015, pp. 1161–1162.

Rodrigo J Carbajales et al. "Energy-efficient Internet of Things monitoring with low-capacity devices". In: *2015 IEEE 2nd World Forum on Internet of Things (WF-IoT)*. IEEE. 2015, pp. 305–310.

Hope Mauwa, Antoine Bagula, and Marco Zennaro. "Exploring tv white spaces for use in campus networks". In: *International Conference on e-Infrastructure and e-Services for Developing Countries*. Springer, Cham. 2015, pp. 14–25.

Hope Mauwa, Antoine Bagula, and Marco Zennaro. "WHITENET: A white space network for campus connectivity using spectrum sensing design principles". In: *2015 ITU Kaleidoscope: Trust in the Information Society (K-2015)*. IEEE. 2015, pp. 1–8.

Hope Mauwa et al. "On the impact of propagation models on TV white spaces measurements in Africa". In: *2015 International Conference on Emerging Trends in Networks and Computer Communications (ETNCC)*. IEEE. 2015, pp. 148–154.

Claro Noda et al. "On the scalability of constructive interference in low-power wireless networks". In: *European Conference on Wireless Sensor Networks*. Springer, Cham. 2015, pp. 250–257.

Marco Rainone, Marco Zennaro, and Ermanno Pietrosemoli. "Rftrack: Twsw spectrum measurements using android phones". In: *Proceedings of the 2015 Annual Symposium on Computing for Development*. 2015, pp. 67–68.

Arjuna Sathiaseelan et al. "From the chairs". In: *ACM DEV-6 2015-Proceedings of the 2015 Annual Symposium on Computing for Development*. 2015, p. iii.

Timothy X Brown et al. "A survey of TV white space measurements". In: *International Conference on e-Infrastructure and e-Services for Developing Countries*. Springer, Cham. 2014, pp. 164–172.

Román Lara-Cueva et al. "Performance evaluation of a volcano monitoring system using wireless sensor networks". In: *2014 IEEE Latin-America Conference on Communications (LATINCOM)*. IEEE. 2014, pp. 1–6.

Sindiso M Nleya et al. "A non-cooperative TV white space broadband market model for rural entrepreneurs". In: *Proceedings of the 2014 ITU kaleidoscope academic conference: Living in a converged world-Impossible without standards?* IEEE. 2014, pp. 79–85.

C Onime, J Uhomoibhi, and M Zennaro. "Demonstration of a low cost implementation of an existing hands-on laboratory experiment in electronic engineering". In: *2014 11th International Conference on Remote Engineering and Virtual Instrumentation (REV)*. IEEE. 2014, pp. 195–197.

Simone Sala et al. "Mitigation of Rain-Induced Ka-Band Attenuation and Enhancement of Communications Resiliency in Sub-Saharan Africa". In: *SIG GlobDev 2014*. 2014.

Marco Zennaro, Ermanno Pietrosemoli, and Arjuna Sathiaseelan. "Architecting a low cost television white space network for developing regions". In: *Proceedings of the Fifth ACM Symposium on Computing for Development*. 2014, pp. 113–114.

Andrés Arcia-Moret, Ermanno Pietrosemoli, and Marco Zennaro. "Whisppi: White space monitoring with raspberry pi". In: *Global Information Infrastructure Symposium-GIIS 2013*. IEEE. 2013, pp. 1–6.

Javi Jiménez et al. "Supporting cloud deployment in the Guifi. net community network". In: *Global Information Infrastructure Symposium-GIIS 2013*. IEEE. 2013, pp. 1–3.

Million MafutaA et al. "Successful Deployment of a Wireless Sensor Network for Precision Agriculture in Malawi-WiPAM". In: *3rd IEEE International Conference On Networked Embedded Systems For Every Application*. 2013.

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Marco Zennaro et al. "An assessment study on white spaces in Malawi using affordable tools". In: *2013 IEEE Global Humanitarian Technology Conference (GHTC)*. IEEE. 2013, pp. 265–269.

Marco Zennaro et al. "TV white spaces, I presume? the quest for TVWS in Malawi and Zambia". In: *Proceedings of the Sixth International Conference on Information and Communications Technologies and Development: Notes-Volume 2*. 2013, pp. 175–178.

R Lowe et al. "A platform to integrate climate information and rural telemedicine in Malawi". In: *EGU General Assembly Conference Abstracts*. Vol. 14. 2012, p. 9503.

Ermanno Pietrosevoli, Marco Zennaro, and Carlo Fonda. "Low cost carrier independent telecommunications infrastructure". In: *2012 Global Information Infrastructure and Networking Symposium (GIIS)*. IEEE. 2012, pp. 1–4.

Marco Zennaro, Antoine Bagula, and Mayamiko Nkoloma. "From training to projects: Wireless sensor networks in Africa". In: *2012 IEEE Global Humanitarian Technology Conference*. IEEE. 2012, pp. 417–422.

Marco Zennaro et al. "On the relevance of using affordable tools for white spaces identification". In: *2012 IEEE 8th International Conference on Wireless and Mobile Computing, Networking and Communications (WiMob)*. IEEE. 2012, pp. 606–611.

Mayamiko Nkoloma, Marco Zennaro, and Antoine Bagula. "Sm 2: Solar monitoring system in malawi". In: *Proceedings of ITU Kaleidoscope 2011: The Fully Networked Human?-Innovations for Future Networks and Services (K-2011)*. IEEE. 2011, pp. 1–6.

Hervé Ntareme, Marco Zennaro, and Björn Pehrson. "Delay tolerant network on smartphones: Applications for communication challenged areas". In: *Proceedings of the 3rd Extreme Conference on Communication: The Amazon Expedition*. 2011, pp. 1–6.

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David Gascón et al. "Experimental Evaluation of Radio Transceivers for Sensor Networks in Harsh Environments". In: *Proceedings of European Conference on Wireless Sensor Networks (EWSN 2010), 17-19th February 2010, Coimbra, Portugal*. 2010.

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Marco Zennaro et al. "Planning and deploying long distance wireless sensor networks: The integration of simulation and experimentation". In: *International Conference on Ad-Hoc Networks and Wireless*. Springer, Berlin, Heidelberg. 2010, pp. 191–204.

Marco Zennaro et al. "On the design of a water quality wireless sensor network (wqwsn): An application to water quality monitoring in malawi". In: *2009 international conference on parallel processing workshops*. IEEE. 2009, pp. 330–336.

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Rob Flickenger et al. "Very long distance wi-fi networks". In: *Proceedings of the second ACM SIGCOMM workshop on Networked systems for developing regions*. 2008, pp. 1–6.

Marco Zennaro, Hervé Ntareme, and Antoine Bagula. "Experimental evaluation of temporal and energy characteristics of an outdoor sensor network". In: *Proceedings of the International Conference on Mobile Technology, Applications, and Systems*. 2008, pp. 1–5.

Marco Zennaro, Hervé Ntareme, and Antoine Bagula. "On the design of a flexible gateway for Wireless Sensor Networks". In: *First International Workshop on Wireless Broadband Access for Communities and Rural Developing Regions 2008, Uppsala, Sweden*. 2008.

Marco Zennaro, Bjorn Pehrson, and Antoine Bagula. "Wireless Sensor Networks: a great opportunity for researchers in Developing Countries". In: *Proceedings of WCITD2008 Conference, Pretoria, South Africa*. Vol. 67. 2008.

Marco Zennaro et al. "On a long wireless link for rural telemedicine in Malawi". In: *6th International Conference on Open Access Lilongwe, Malawi*. 2008.

Enrique Canessa, Carlo Fonda, and Marco Zennaro. "EyA system: Automated audio-video-slide recordings". In: *ICL-Interactive Computer Aided Learning, Villach, Austria*. 2007.

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Marco Zennaro, O Fonda, and Enrique Canessa. "Eya: enhance your conference audi-ence using apple technologies". In: *Poster presented at WWDC07-Apple Developers Conference, USA*. 2007.

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