

Usman Zabit

Professor

School of Electrical Engineering and Computer Science

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About

Dr. Usman Zabit is working as Professor in the School of Electrical Engineering and Computer Science. Dr. Usman Zabit has a PhD in Opto-Electronics. Dr. Usman Zabit has published 48 research articles & conference papers having a citation count of 1019, carried out 1 projects and filed 0 intellectual property.

Qualifications

PhD in Opto-Electronics Institut National Polytechnique de Toulouse , France	2006 - 2010
MS in Microwaves Electromagnetism Opto-Electronics Institut National Polytechnique de Toulouse , France	2005 - 2006
B.Sc (Hon) in Electronics & Communication UET Taxila , Pakistan	1997 - 2001

Experience

Professor School of Electrical Engineering and Computer Science	2021- Present
Professor School of Electrical Engineering and Computer Science	2020 - 2021
Associate Professor School of Electrical Engineering and Computer Science	2017 - 2020
Associate Professor Riphah International University , I-14, Islamabad	2012 - 2017
Post-Doctoral Research Engineer INPT, LAAS-CNRS , Toulouse, France	2010 - 2012
Lecturer INP Toulouse , Toulouse, France	2009 - 2010
Teaching Assistant INP Toulouse , Toulouse, France	2006 - 2009
Assistant Div Engineer PTCL , Islamabad	2002 - 2005
Assistant Manager NESCOM , Islamabad	2002 - 2002
Apprentice Engineer FFC , Goth Machi, Rahim Yar Khan	2002 - 2002

Awards

INP Innovation Award Institut National Polytechnique de Toulouse, France	2012
Leopold Escande Prize Institut National Polytechnique de Toulouse, France	2011
Best Thesis Prize Doctoral School G.E.E.T, Univ of Toulouse, France	2011
Euro Mechatronics Award European Mechatronics Meeting	2010

Industry Projects

National Projects	
ADDRESSING CARBON EMISSIONS BY CONTRIBUTING TOWARDS CLIMATE CHANGE MITIGATION Client: MoCC and UNDP_Isb Amount: PKR 2,800,000.00 Status: Approved_inprocess	2020

International Projects

Research Articles

Efficient Computation of Laser Self-Mixing Sensor Signal Under Variable Optical Feedback <i>Syed Muhammad Muslim Olivier D. Bernal Usman Zabit</i> <i>IEEE Sensors Journal</i> , Volume:25, Issue:15, Pages 28299-28307 Impact Factor: 4.500 Quartile: 1 DOI: 10.1109/JSEN.2025.3581469	2025
Robust integrated optical feedback interferometry via variable optical attenuation <i>Ayesha Arshad Usman Zabit Olivier Bernal Clement Deleau Robert Halir</i> <i>Optics Express</i> , Volume:33, Issue:8, Pages 17566-17579 Impact Factor: 3.300 Quartile: 2 Citations: 1 DOI: https://doi.org/10.1364/OE.550127	2025
Optical Feedback FM-to-AM Conversion With Photonic Integrated Circuits for Displacement Sensing Applications <i>Clement Deleau Han Cheng Seat Frederic Surre Usman Zabit Francis Jayat T. Bosch Olivier Bernal</i> <i>Journal of Lightwave Technology</i> , Volume 42, Issue 9, Pages 3446-3453 Impact Factor: 4.100 Quartile: 1 Citations: 6 DOI: 10.1109/JLT.2024.3355048	2024
Direct Estimation of the Optical Feedback Factor C from the Amplitude of the Optical Feedback Interferometric Signal <i>O. Bernal H. C. Seat Usman Zabit F. Surre</i> <i>IEEE TRANSACTIONS ON INSTRUMENTATION AND MEASUREMENT</i> , Volume: 72, Article Number:7006207 Impact Factor: 5.6 Quartile: 1 Citations: 5 DOI: 10.1109/TIM.2023.3300431	2023
Integration of Zero Crossing Method in a Non-Uniform Sampling System using Optical Feedback Interferometry <i>Hajira S. Bazaz Mohaimen M. Fatimah Layba Asim Usman Zabit Olivier D. Bernal</i> <i>IEEE Sensors Journal</i> , Volume: 23, Issue: 13, Page(s): 14397-14405 Impact Factor: 4.3 Quartile: 1 Citations: 7 DOI: 10.1109/JSEN.2023.3275702	2023
Augmentation-Assisted Robust Fringe Detection on Unseen Experimental Signals Applied to Optical Feedback Interferometry Using a Deep Network <i>Sumair Saeed Khurshid Wajahat Hussain Usman Zabit Olivier Bernal</i> <i>IEEE Transactions on Instrumentation and Measurement</i> , Volume 72, Article Number 2508110 Impact Factor: 5.332 Quartile: 1 Citations: 8 DOI: https://doi.org/10.1109/TIM.2023.3251409	2023

Fringe Detection and Displacement Sensing for Variable Optical Feedback-Based Self-Mixing Interferometry by Using Deep Neural Networks <i>Asra Abid Siddiqui Usman Zabit Olivier D. Bernal</i> <i>Sensors</i> , Volume 22, Issue 24, Article Number 9831 Impact Factor: 3.9 Quartile: 2 Citations: 7 DOI: https://doi.org/10.3390/s22249831	2022
Real-time Adaptive Spectral Filter based Parasitic Vibration Cancellation in Self-Mixing Laser Sensor Signals <i>Muhammad Naveed Usman Zabit</i> <i>IEEE Sensors Journal</i> , Volume 21, No. 21, Pages 24371-24378 Impact Factor: 4.325 Quartile: 1 Citations: 6 DOI: 10.1109/JSEN.2021.3112477	2021
PH-RLS: A parallel hybrid recursive least square algorithm for self-mixing interferometric laser sensor <i>Zohaib A Khan Tassadaq Hussain Usman Zabit Muhammad Usman Eduard Ayguade</i> <i>IET Optoelectronics</i> , Volume 15, Issue 5, Pages 239-247 Impact Factor: 1.636 Quartile: 3 Citations: 4 DOI: https://doi.org/10.1049/ote2.12021	2021
Implementation of a high-accuracy phase unwrapping algorithm using parallel-hybrid programming approach for displacement sensing using self-mixing interferometry <i>Tassadaq Hussain Saqib Amin Usman Zabit Eduard Ayguade</i> <i>The Journal of Supercomputing</i> , Volume 77, Pages 9433–9453 Impact Factor: 2.474 Quartile: 2 Citations: 11 DOI: https://doi.org/10.1007/s11227-021-03634-6	2021
Nanometric Vibration Sensing using Spectral Processing of Laser Self-Mixing Feedback Phase <i>Nauman Ali Usman Zabit Olivier D. Bernal</i> <i>IEEE Sensors Journal</i> , Volume 21, No.16, Pages 17766-17774 Impact Factor: 3.301 Quartile: 1 Citations: 23 DOI: 10.1109/JSEN.2021.3083643	2021
Variable Optical Feedback Based Behavioral Model of a Self-Mixing Laser Sensor <i>Usman Haider Usman Zabit Olivier D. Bernal</i> <i>IEEE Sensors Journal</i> , vol. 21, no. 15, pp. 16568-16575 Impact Factor: 4.325 Quartile: 1 Citations: 5 DOI: 10.1109/JSEN.2021.3077251	2021
Toward an Estimation of the Optical Feedback Factor C on the Fly for Displacement Sensing <i>Olivier D. Bernal Usman Zabit Francis Jayat Thierry Bosch</i> <i>Sensors</i> , Volume 21(10), Article Number 3528 Impact Factor: 3.847 Quartile: 1 Citations: 7 DOI: https://doi.org/10.3390/s21103528	2021
Sparsity Promoting Frequency Sampling Method for Estimation of Displacement and Self-Mixing Interferometry Parameters <i>Junaid Iqbal Khan Usman Zabit</i> <i>IEEE Sensors Journal</i> , Volume 21, Issue 9, Pages 10587-10594 Impact Factor: 4.325 Quartile: 1 Citations: 13 DOI: 10.1109/JSEN.2021.3060740	2021
On Two Fourier Transform-Based Methods for Estimation of Displacement and Parameters of Self-Mixing Interferometry Over Major Optical Feedback Regimes <i>Junaid Iqbal Khan Usman Zabit</i> <i>IEEE Sensors Journal</i> , Volume 21, Issue 9, Pages 10610-10617 Impact Factor: 4.325 Quartile: 1 Citations: 5 DOI: 10.1109/JSEN.2021.3062550	2021
Deformation Method of Self-Mixing Laser Sensor's Feedback Phase for Estimation of Optical Feedback Coupling Factor and Displacement <i>Junaid Iqbal Khan Usman Zabit</i> <i>IEEE Sensors Journal</i> , Volume 21, Issue 6, Pages 7490-7497 Impact Factor: 4.325 Quartile: 1 Citations: 7 DOI: 10.1109/JSEN.2020.3046266	2021

Multi-modal fringe detection for self-mixing interferometry based vibration sensor <i>Muhammad Usman Usman Zabit Syed Asad Alam</i> <i>Applied Optics</i> , Volume 59, Issue 36, Pages 11342-11350 Impact Factor: 1.980 Quartile: 3 Citations: 2 DOI: https://doi.org/10.1364/AO.410747	2020
Adaptive Estimation and Reduction of Noises Affecting a Self-Mixing Interferometric Laser Sensor <i>Zohaib A. Khan Olivier D Bernal Tassadaq Hussain Usman Zabit</i> <i>IEEE Sensors Journal</i> , Volume 20, Issue 17, Pages 9806-9815 Impact Factor: 3.301 Quartile: 2 Citations: 20 DOI: 10.1109/JSEN.2020.2992848	2020
High Resolution Laser Self-Mixing Displacement Sensor Under Large Variation in Optical Feedback and Speckle <i>Saqib Amin Olivier D Bernal Tassadaq Hussain Usman Zabit</i> <i>IEEE Sensors Journal</i> , Volume 20, Issue 16, Pages 9140-9147 Impact Factor: 3.301 Quartile: 2 Citations: 37 DOI: 10.1109/JSEN.2020.2988851	2020
Sub-$\lambda/2$ Displacement Sensor With Nanometric Precision Based on Optical Feedback Interferometry Used as a Non-Uniform Event-Based Sampling System <i>Olivier D Bernal Thierry Bosch Francis Jayat Usman Zabit</i> <i>IEEE Sensors Journal</i> , Volume 20, No. 10, Pages 5195-5203 Impact Factor: 3.301 Quartile: 2 Citations: 22 DOI: 10.1109/JSEN.2020.2970599	2020
Fault Detection and Localization for Overhead 11-kV Distribution Lines With Magnetic Measurements <i>Khawaja Arsalan Habib Muhammad Kazim Usman Zabit Qi Huang</i> <i>IEEE Transactions on Instrumentation and Measurement</i> , Volume 69, Issue 5, Pages 2028-2038 Impact Factor: 4.016 Quartile: 1 Citations: 72 DOI: 10.1109/TIM.2019.2920184	2020
Blind identification of occurrence of multi-modality in laser-feedback-based self-mixing sensor <i>Muhammad Usman Usman Zabit Olivier D. Bernal Gulistan Raja</i> <i>Chinese Optics Letters</i> , Vol. 18, Issue 1, Article No.11201 Impact Factor: 2.448 Quartile: 2 Citations: 4 DOI: 10.3788/COL202018.011201	2020
Detection of Multimodal Fringes for Self-Mixing-Based Vibration Measurement <i>Muhammad Usman Olivier D. Bernal Gulistan Raja Thierry Bosch Muhammad Usman Usman Zabit Olivier D. Bernal Gulistan Raja Thierry Bosch</i> <i>IEEE Transactions on Instrumentation and Measurement</i> , Vol. 69, No.1, Pages 258-267 Impact Factor: 4.016 Quartile: 1 Citations: 33 DOI: 10.1109/TIM.2019.2895928	2020
Self-Mixing Interferometric Signal Enhancement Using Generative Adversarial Network for Laser Metric Sensing Applications <i>Imran Ahmed Usman Zabit Ahmad Salman Imran Ahmed</i> <i>IEEE Access</i> , Volume 7, Pages 179002-179009 Impact Factor: 3.745 Quartile: 1 Citations: 31 DOI: 10.1109/ACCESS.2019.2957272	2019
Spectral Processing of Self-Mixing Interferometric Signal Phase for Improved Vibration Sensing under Weak- and Moderate-Feedback Regime <i>Usman Zabit Olivier D. Bernal Saqib Amin Muhammad Farrukh Qureshi Thierry Bosch Arsalan Habib Khawaja</i> <i>IEEE Sensors Journal</i> , Volume: 19, Issue: 23, Pages 11151-11158 Impact Factor: 3.073 Quartile: 2 Citations: 42 DOI: 10.1109/JSEN.2019.2935087	2019
A High Performance Real-time Interferometry Sensor System Architecture <i>Usman Zabit Tassadaq Hussain Saqib Amin Olivier D. Bernal Thierry Bosch</i> <i>Microprocessors and Microsystems</i> , Volume 64, Pages 23-33 Impact Factor: 1.161 Quartile: 3 Citations: 18 DOI: 10.1016/j.micpro.2018.10.006	2019
Automatic Detection of Multi-modality in Self-Mixing Interferometer	2018

<i>Usman Zabit Khadija Shaheen Maryam Naveed Olivier D. Bernal Thierry Bosch</i> <i>IEEE Sensors Journal</i>, Volume 18, Issue 22, Pages 9195-9202 Impact Factor: 3.076 Quartile: 1 Citations: 10 DOI: 10.1109/JSEN.2018.2869771	2018
Hardware implementation and comparison of displacement retrieval algorithms for a laser diode-based optical feedback interferometric sensor <i>Usman Zabit Ghazi REHMAN Muhammad Obaid ULLAH</i> <i>Turkish Journal of Electrical Engineering and Computer Sciences</i>, Vol. 26, No. 4, Pages:1820-1832 Impact Factor: 0.625 Quartile: 4 DOI: 10.3906/elk-1708-117	2018
Analysis and Implementation of a Direct Phase Unwrapping Method for Displacement Measurement Using Self-Mixing Interferometry <i>Usman Zabit Ayesha Ehtesham Gulistan Raja Olivier D. Bernal Thierry Bosch</i> <i>IEEE Sensors Journal</i>, NULL Impact Factor: 2.617 Quartile: 1 Citations: 46 DOI: 10.1109/JSEN.2017.2758440	2017
All Analog Processing of Speckle Affected Self-Mixing Interferometric Signals <i>Asra Abid Siddiqui Usman Zabit Olivier D. Bernal Gulistan Raja Thierry Bosch</i> <i>IEEE Sensors Journal</i>, Volume 17, Issue 18, Pages 5892-5899 Impact Factor: 2.617 Quartile: 1 Citations: 30 DOI: 10.1109/JSEN.2017.2737472	2017
Adaptive Cancellation of Parasitic Vibrations Affecting a Self-Mixing Interferometric Laser Sensor <i>Zohaib Ahmad Khan Usman Zabit Olivier D. Bernal Muhammad Obaid Ullah Thierry Bosch</i> <i>IEEE Transactions on Instrumentation & Measurements</i>, Volume 66, Issue 2, Pages 332-339 Impact Factor: 2.794 Quartile: 1 Citations: 38 DOI: 10.1109/TIM.2016.2626018	2017
Robust Detection of Non-Regular Interferometric Fringes From a Self-Mixing Displacement Sensor Using Bi-Wavelet Transform <i>Olivier D. Bernal Han Cheng Seat Usman Zabit Frédéric Surre Thierry Bosch</i> <i>IEEE Sensors Journal</i>, Volume 16, Issue 22, Pages 7903-7910 Impact Factor: 2.512 Quartile: 1 Citations: 38 DOI: 10.1109/JSEN.2016.2599702	2016
Robust Method of Stabilization of Optical Feedback Regime by Using Adaptive Optics for a Self-Mixing Micro-Interferometer Laser Displacement Sensor <i>Olivier D. Bernal Usman Zabit Thierry Bosch</i> <i>IEEE Journal of Selected Topics in Quantum Electronics</i>, Volume 21, Issue 4, Article Number 5300108 Impact Factor: 3.466 Quartile: 1 Citations: 53 DOI: 10.1109/JSTQE.2014.2381494	2015
Classification of Laser Self-Mixing Interferometric Signal under Moderate Feedback <i>Olivier D. Bernal Usman Zabit Thierry Bosch</i> <i>Applied Optics</i>, Volume 53, No. 4, Pages 702-708 Impact Factor: 1.784 Quartile: 2 Citations: 36 DOI: 10.1364/AO.53.000702	2014
Study of Laser Feedback Phase Under Self-Mixing Leading to Improved Phase Unwrapping for Vibration Sensing <i>Olivier D. Bernal Usman Zabit Thierry Bosch</i> <i>IEEE Sensors Journal</i>, vol. 13, no. 12, pp. 4962-4971 Impact Factor: 1.851 Quartile: 1 Citations: 70 DOI: 10.1109/JSEN.2013.2276106	2013
Design and analysis of an embedded accelerometer coupled self-mixing laser displacement sensor <i>Usman Zabit Olivier D. Bernal Thierry Bosch</i> <i>IEEE Sensors Journal</i>, Volume 13, Issue 6, Pages 2200-2207 Impact Factor: 1.851 Quartile: 1 Citations: 37 DOI: 10.1109/JSEN.2013.2251626	2013
Self-Mixing Laser Sensor for Large Displacements: Signal Recovery in the Presence of Speckle	2013

Usman Zabit Olivier D. Bernal Thierry Bosch
IEEE Sensors Journal, Volume 13 Issue 2 Pages 824-831
Impact Factor: 1.851 | **Quartile:** 1 | **Citations:** 47
DOI: 10.1109/JSEN.2012.2227718

MEMS accelerometer embedded in a self-mixing displacement sensor for parasitic vibration compensation 2011

Usman Zabit Olivier D. Bernal Thierry Bosch Francis Bony
Optics Letters, Volume 36, Issue 5, Pages 612-614
Impact Factor: 3.866 | **Quartile:** 1 | **Citations:** 32
DOI: 10.1364/OL.36.000612

Adaptive self-mixing vibrometer based on a liquid lens 2010

Usman Zabit R. Atashkhoei Thierry Bosch S. Royo F. Bony A. D. Rakic
Optics Letters, Volume 35, Issue 8, Pages 1278-1280
Impact Factor: 3.318 | **Quartile:** 1 | **Citations:** 53
DOI: 10.1364/OL.35.001278

A Self-mixing Displacement Sensor with Fringe-loss Compensation for Harmonic Vibrations 2010

Usman Zabit Francis Bony Thierry Bosch Aleksandar D. Rakic
IEEE Photonics Technology Letters, Volume 22, Issue 6, Pages 410-412
Impact Factor: 1.988 | **Quartile:** 1 | **Citations:** 75
DOI: 10.1109/LPT.2010.2040825

Adaptive Transition Detection Algorithm for a Self-Mixing Displacement Sensor 2009

Usman Zabit Thierry Bosch F. Bony
IEEE Sensors Journal, Volume 9, Issue 12, Pages 1879-1886
Impact Factor: 1.581 | **Quartile:** 2 | **Citations:** 58
DOI: 10.1109/JSEN.2009.2031496

Conference Proceedings

Optical Feedback FM-to-AM Conversion with integrated Micro-Ring Resonator for Displacement Sensing Applications <i>Clement Deleau Han Cheng Seat Frederic Surre Usman Zabit Pierre-François Calmon Olivier Bernal</i> 15th International AIVELA Conference on Vibration Measurements by Laser and Noncontact Techniques, Ancona, Italy, res.country(109,) Citations: N/A DOI: 10.1088/1742-6596/2698/1/012016	2023
Towards Integrated Optical Feedback FM-to-AM Conversion in Silicon Nitride for Displacement Sensing Applications <i>C. Deleau T. Apihatnaphakul H. C. Seat F. Surre Usman Zabit F. Carcenac Pierre-François Calmon T. Bosch O. Bernal</i> Conference, SENSORS 2022 , res.country(233,) Citations: N/A DOI: 10.1109/SENSORS52175.2022.9967153	2022
Non-Uniform Sampling Theory applied to FM Channel Optical Feedback Interferometry for Displacement Sensors <i>O. Bernal H. C. Seat C. Deleau T. Bosch F. Surre Usman Zabit</i> Proceedings of IEEE Sensors , res.country(233,) Citations: N/A DOI: 10.1109/SENSORS52175.2022.9967106	2022
Non-Uniform Sampling Theory applied to Optical Feedback Interferometry for Displacement Sensors <i>Usman Zabit Usman Zabit Olivier D Bernal T. Niakan A. Raghubanshi F. Jayat T. Bosch</i> IEEE International Instrumentation and Measurement Technology Conference (I2MTC) Citations: N/A DOI: 10.1109/I2MTC43012.2020.9129027	2020
Detection of Multi-Modality in Self-Mixing Interferometry <i>M. Usman Usman Zabit Syed Asad Alam</i> 17th International Bhurban Conference on Applied Sciences and Technology, IBCAST 2020, res.country(177,) Citations: N/A DOI: 10.1109/IBCAST47879.2020.9044606	2020
Detection of Self-Mixing Interferometric Fringes of a Laser Sensor Using Matched Filter <i>M. Akmal Usman Zabit O. Bernal Thierry Bosch</i> 31st Eurosensors Conference, Paris, France, res.country(75,) Citations: N/A DOI: 10.3390/proceedings1040590	2017
Robust fringe detection based on bi-wavelet transform for self-mixing displacement sensor <i>Olivier Bernal Han Cheng Seat Usman Zabit Frederic Surre T. Bosch</i> 2015 IEEE SENSORS - Proceedings , res.country(121,) Citations: N/A DOI: 10.1109/ICSENS.2015.7370375	2015

Editorial Activities

IEEE Sensors Journal Reviewed Papers for Journals Impact Factor: 4.325	2023
Optics Letters Reviewed Papers for Journals Impact Factor: 3.560	2023