

*Curriculum Vitae*  
**LEJLA GURBETA, MSc.**

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*Work Address*

Verlab Ltd Sarajevo  
Medical Devices Verification Laboratory  
Ismeta Mujezinovića 30,  
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E-mail: [lejla@verlab.ba](mailto:lejla@verlab.ba)

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## **EDUCATION**

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- 2015 – expected 2018      **International Burch University, Faculty of Engineering and Natural Sciences, Genetics and Bioengineering Department, Sarajevo, Bosnia and Herzegovina**  
Doctor of Philosophy in Biomedical Engineering,  
THESIS TITLE: Determining and experimental validation of uncertainty and documenting traceability chain in measurements of temperature, humidity and sound in infant incubators
- 2013 – 2015      **University of Sarajevo, Faculty of Electrical Engineering Sarajevo, Bosnia and Herzegovina**  
Master of Engineering Science in Electrical Engineering,  
RESEARCH AREA: Automation Control and Robotics
- 2010 – 2013      **University of Sarajevo, Faculty of Electrical Engineering Sarajevo, Bosnia and Herzegovina**  
Bachelor of Engineering Science in Electrical Engineering

## **WORK EXPERIENCE**

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- 2015 – Present      **Head of the laboratory Verlab Ltd Sarajevo, Medical Devices Verification Laboratory of National Metrology Institute (NMI) of Bosnia and Herzegovina**
- Working on establishing quality management system for Medical Devices Verification Laboratory in Bosnia and Herzegovina. Laboratory main area is the independent inspection of medical devices according to legal metrology rules (ECG devices, defibrillators, patient monitors, infusion pumps, perfusors, anesthesia machines, respirators, infant incubators, therapeutic ultrasound, dialysis machines and blood pressure devices).
  - Laboratory managing and supervising.
  - Organization and management of the technical part of the work process.
  - Resolving user complaints and management of non-compliant inspections and researches by the management.
  - Supervision over Laboratory staff.
  - Proposing measures for Laboratory Improvement.
  - Encouraging and motivating Laboratory staff.
  - Reporting according to Company Management rules.
  - Accreditation of laboratory by ISO 17020.

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- Certification of laboratory by ISO 9001.
  - Establishing and running the first digital database eVerlab which contains medical devices verification results.
- 2015 - Present      **Teaching Assistant at Genetics and Bioengineering Department**, Faculty of Engineering and Natural Sciences, International Burch University Sarajevo, Bosnia and Herzegovina
- Teaching Courses at Undergraduate programs:
    - a. Biomedical Instrumentation
    - b. Biomedical Signals and Systems
    - c. Biosensors
    - d. Intelligent Systems
    - e. Calculus I
    - f. Calculus II
- 2016 – Present      **Secretary General**, Bosnia and Herzegovina Medical and Biological Engineering Society (IFMBE and EAMBES country representative)
- Managing daily activities of the Society.
  - Connection to local and international partners.
  - Administrative work.
  - Writing project proposals.
- Organizing IEEE/IFMBE International Conference on Medical and Biological Engineering in Bosnia and Herzegovina (CMBEBIH).
- 2016 – Present      **Senior Teaching Assistant**, Technical Faculty University of Bihać
- Teaching Courses at Undergraduate programs:
    - a. Intelligent systems
    - b. Artificial Intelligence
    - c. Electrical Engineering I
    - d. Electrical Engineering II

## TRAINING AND SPECIALIZATION

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- 2016    Quality control: Requirements of BAS ISO IEC 17020 standard, BATA - BH Institute for accreditation
- 2016    Quality control: Requirements of ISO 17020: Risk management, Supera kvaliteta, Croatia
- 2016    Pasco Scientific Sensors, Ljubljana, Slovenia
- 2015    Quality control: Requirements of BAS ISO IEC 17020 standard, BATA - BH Institute for accreditation
- 2014    Fluke Biomedical – Verification of medical devices.
  - Training for operating with testing equipment:*
    - Fluke ESA620 electrical safety analyzer
    - Fluke 6000/7000DP defibrillator analyzer
    - Fluke ProSim8 ECG device and patient monitor analyzer
    - Fluke INCU analyzer
    - Ohmico UPM - therapeutical ultrasound analyzer
    - Fluke VT305 respirators and anesthesia machine analyzer
    - Fluke IDA5 – perfusor and infusomat analyzer

## TEACHING EXPERIENCE

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### Undergraduate teaching

2015 - Present **Industry Expert – Teaching Assistant at Genetics and Bioengineering Department**, Faculty of Engineering and Natural Sciences, International Burch University Sarajevo, Bosnia and Herzegovina

- Teaching Courses at Undergraduate programs:
  - g. Biomedical Instrumentation
  - h. Biomedical Signals and Systems
  - i. Biosensors
  - j. Intelligent Systems
  - k. Calculus I
- Calculus II

2016– Present **Senior Teaching Assistant**, Technical Faculty University of Bihać

- Teaching Courses at Undergraduate programs:
  - e. Intelligent systems
  - f. Artificial Intelligence and Expert Systems
  - g. Electrical Engineering I
  - h. Electrical Engineering II

## SCHOLARLY CONTRIBUTIONS

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### Book Chapters

1. Badnjevic A., Cifrek M., Gurbeta L., Feric E., „Classification of Chronic Obstructive Pulmonary Diseases Based on Neuro-Fuzzy Software“ in the Book: „Chronic Obstructive Pulmonary Disease (COPD): Clinical Symptoms, Emerging Treatment Strategies and Impact on Quality of Life“, 2016, Nova Science Publisher, ISBN: 978-1-63484-500-7, 2016.
2. Granulo E, Becar L, Gurbeta L, Badnjevic A., „Telemetry System for Diagnosis of Asthma and Chronical Obstructive Pulmonary Disease (COPD)“, Internet of Things Technologies for HealthCare. Mobyen Uddid Ahmed, Shahina Begum, Wasim Raad. Springer International Publishing, 2016, pp. 113-118, DOI:10.1007/978-3-319-51234-1\_18
3. Gurbeta L., Izetbegović S., Badnjević-Čengiđ A., (2018) Inspection and Testing of Infant Incubators. In: Badnjević A., Cifrek M., Magjarević R., Džemić Z. (eds) Inspection of Medical Devices. Series in Biomedical Engineering. Springer, Singapore

### Refereed Journal Publications

1. Badnjevic A, Gurbeta L, Boskovic D, Dzemic Z. „Measurement in medicine – Past, present, future“, Folia Medica Facultatis Medicinae Universitatis Saraeviensis Journal (2015) 50(1): 43-46
2. Mustoo S., Gurbeta L., (2015) Turning the Challenge into Opportunity – A Strategic Framework for the Biomedical Engineering Development in Bosnia and Herzegovina Folia Med. Fac. Med. Univ. Saraeviensis; 50(1): 18-22

3. Badnjevic – Cengic A, Kovacevic P, Dragic S, Momcicevic D, Badnjevic A, Gurbeta L, Hasanefendic B. „Serum nitric oxide levels in patients with acute myocardial infarction with ST elevation (STEMI)“, *Respiron Journal* (2015) Vol 5, No 1-2
4. Gurbeta L, Badnjević A., „Inspection process of medical devices in healthcare institutions: software solution,“ *Health Technol.* (2017) Volume 7, Issue 1, pp 109–117, doi:10.1007/s12553-016-0154-2
5. Badnjevic A, Gurbeta L, Jimenez E.R., Iadanza E. „Testing of mechanical ventilators and infant incubators in healthcare institutions“ *Technology and Health Care* (2017) vol. 25, no. 2, pp. 237-250
6. Gurbeta, L., Dzemic, Z., Bego, T., Sejdic, E., Badnjevic, A. „Testing of Anesthesia Machines and Defibrillators in Healthcare Institutions“, *J Med Syst* (2017) 41: 133. <https://doi.org/10.1007/s10916-017-0783-7>
7. Hodzic J, Gurbeta L, Omanovic-Miklicanin E, Badnjevic A. „Overview of Next-generation Sequencing Platforms Used in Published Draft Plant Genomes in Light of Genotypization of Immortelle Plant (*Helichrysum Arenarium*)“, *MED ARCH.* (2017) 71(4): 288-292, doi: 10.5455/medarh.2017.71.288-292
8. Catic A., Gurbeta L., Kurtovic-Kozaric A., Mehmedbasic S., Badnjevic A. “Application of Neural Networks for classification of Patau, Edwards, Down, Turner and Klinefelter Syndrome based on first trimester maternal serum screening data, ultrasonographic findings and patient demographics”, *BMC Medical Genomics* (2018) 11:19, DOI: 10.1186/s12920-018-0333-2
9. Gurbeta L., Maksimovic M, Omanovic-Miklicanin E., Badnjevic A., Sejdic E., A telehealth system for automated diagnosis of asthma and chronic obstructive pulmonary disease. *Journal of the American Medical Informatics Association* 2018
10. A Badnjevic, L Gurbeta, E Custovic. An Expert Diagnostic System to Automatically Identify Asthma and Chronic Obstructive Pulmonary Disease in Clinical Settings, *Scientific Reports*, (2018) In-press

### Refereed Conference Proceedings

1. Badnjevic A, Gurbeta L, Boskovic D, Dzemic Z. „Medical devices in legal metrology“, *IEEE 4th Mediterranean Conference on Embedded Computing (MECO)*, pp: 365-367, 14 – 18 June 2015, Budva, Montenegro
2. Gurbeta L, Badnjevic A, Pinjo N, Ljumic F, „ Software Package for Tracking Status of Inspection Dates and Reports of Medical Devices in Healthcare Institutions of Bosnia and Herzegovina“, *XXV International Conference on Information, Communication and Automation Technologies (IEEE ICAT)*, pp:1-5, 29-31 October 2015., Sarajevo, Bosnia and Herzegovina
3. Gurbeta L, Badnjevic A, Sejdinovic D, Alic B, Abd El-Ilah L, Zunic E, „Software Solution for Tracking Inspection Processes of Medical Devices from Legal Metrology System“, *XIV Mediterranean Conference on Medical and Biological Engineering and Computing (MEDICON)*, 31. March – 02. April 2016., Paphos, Cyprus.
4. Badnjevic A, Gurbeta L, Cifrek M, Marjanovic D, „Diagnostic of Asthma Using Fuzzy Rules Implemented in Accordance with International Guidelines and Physicians Experience“, *IEEE 39th International convention on information and communication technology, electronics and microelectronics (MIPRO)*, 30. May to 03. June 2016. Opatija, Croatia
5. Badnjevic A, Gurbeta L, Cifrek M, Marjanovic D, „Classification of Asthma Using Artificial Neural Network“, *IEEE 39th International convention on information and communication technology, electronics and microelectronics (MIPRO)*, 30. May to 03. June 2016. Opatija, Croatia

6. Badnjevic A, Gurbeta L, „Development and Perspectives of Biomedical Engineering in South East European Countries“, IEEE 39th International convention on information and communication technology, electronics and microelectronics (MIPRO), 30. May to 03. June 2016. Opatija, Croatia
7. Aljovic A, Badnjevic A, Gurbeta L, „Artificial Neural Networks in the Discrimination of Alzheimer's disease Using Biomarkers Data“, IEEE 5th Mediterranean Conference on Embedded Computing (MECO), 12 – 16 June 2016, Bar, Montenegro
8. Alic B, Sejdinovic D, Gurbeta L, Badnjevic A, „Classification of Stress Recognition using Artificial Neural Network“, IEEE 5th Mediterranean Conference on Embedded Computing (MECO), 12 – 16 June 2016, Bar, Montenegro
9. Halilovic S, Avdihodžić H, Gurbeta L, (2016) Micro cell culture analog Apparatus ( $\mu$ CCA) output prediction using Artificial Neural Network, 5th Mediterranean Conference on Embedded Computing (IEEE MECO 2016), Bar, Montenegro;
10. Granulo E, Becar L, Gurbeta L, Badnjevic A, “Telemetry system for diagnosis of Asthma and Chronical Obstructive Pulmonary Disease (COPD)”, The 3rd EAI International Conference on IoT Technologies for HealthCare, 18-19 October 2016, Vasteras, Sweden
11. Gurbeta L, Badnjevic A, Dzemic Z, Jimenez E.R, Jakupovic A, “Testing of therapeutic ultrasound in healthcare institutions in Bosnia and Herzegovina”, 2nd EAI International Conference on Future Access Enablers of Ubiquitous and Intelligent Infrastructures, 24-25 October 2016, Belgrade, Serbia
12. Veljovic E, Spirtovic – Halilovic S, Muratovic S, Osmanovic A, Badnjevic A, et.al., “Artificial Neural Network and Docking Study in Design and Synthesis of Xanthenes as Antimicrobial Agents”, CMBEBIH 2017. IFMBE Proceedings, vol 62. pp 617-626, Springer, Singapore. DOI: 10.1007/978-981-10-4166-2\_93
13. Alic B, Gurbeta L, Badnjevic A, et.al., “Classification of Metabolic Syndrome patients using implemented Expert System”, CMBEBIH 2017. IFMBE Proceedings, vol 62. pp 601-607, Springer, Singapore. DOI: 10.1007/978-981-10-4166-2\_91
14. Badnjevic A, Gurbeta L, Cifrek M, Pecchia L., “Pre-classification process symptom questionnaire based on fuzzy logic for pulmonary function test cost reduction”, CMBEBIH 2017. IFMBE Proceedings, vol 62. pp 608-616, Springer, Singapore. DOI: 10.1007/978-981-10-4166-2\_92
15. Sejdinovic D, Gurbeta L, Badnjevic A, Malenica M, Dujic T, Causevic A, Bego T, Divovic L, “Classification of prediabetes and Type 2 Diabetes using Artificial Neural Network”, CMBEBIH 2017. IFMBE Proceedings, vol 62. pp 685-689, Springer, Singapore. DOI: 10.1007/978-981-10-4166-2\_103
16. Gurbeta L., Alic B., Dzemic Z., Badnjevic A. (2017) Testing of infusion pumps in healthcare institutions in Bosnia and Herzegovina. In: Eskola H., Väisänen O., Viik J., Hyttinen J. (eds) EMBEC & NBC 2017. EMBEC 2017, NBC 2017. IFMBE Proceedings, vol 65. Springer, Singapore
17. Gurbeta L., Alic B., Dzemic Z., Badnjevic A. (2017) Testing of dialysis machines in healthcare institutions in Bosnia and Herzegovina. In: Eskola H., Väisänen O., Viik J., Hyttinen J. (eds) EMBEC & NBC 2017. EMBEC 2017, NBC 2017. IFMBE Proceedings, vol 65. Springer, Singapore
18. L. Gurbeta, D. Vukovic, Z. Dzemic, A. Badnjevic, Legal metrology procedures for increasing safety and performance characteristics with cost benefits analysis: Case study dialysis machines, IUPESM – The World Congress on Medical Physics & Biomedical Engineering in Prague, June 3–8, 2018
19. L. Gurbeta, Z. Dzemic, A. Badnjevic, Establishing traceability chain of infusion and perfusor pumps using legal metrology procedures in Bosnia and Herzegovina, IUPESM – The World Congress on Medical Physics & Biomedical Engineering in Prague, June 3–8, 2018

20. B. Alić, L. Gurbeta, A. Osmanovic and A. Badnjević, "Machine learning techniques for classification of diabetes and cardiovascular diseases," 2017 6th Mediterranean Conference on Embedded Computing (MECO), Bar, Montenegro, 2017, pp. 1-4. doi: 10.1109/MECO.2017.7977152
21. Kurta. E, Kovacevic Z., A. Osmanovic Gurbeta L., Badnjevic A., Electromagnetic Compatibility of Medical Devices: Effects in everyday healthcare environment. 7th Mediterranean Conference on Embedded Computing MECO'2018, Budva, Montenegro

### Refereed Conference Abstracts

1. Huskic V, Vardo A, Begic E, Hrvat E, Gurbeta L, Dzibur M, Badnjevic A, Dajic A, Kadic A., „Localization and 2D imaging of ST elevation myocardial infarction using software differentiation”, 1st Conference on Medical and Biological Engineering in Bosnia and Herzegovina (CMBEBIH 2015), 13 – 15 March 2015., Sarajevo, Bosnia and Herzegovina
2. Gurbela L, Badnjevic A., „Medical Devices in Legal Metrology Framework“, WHO Global Forum on Medical Devices, 09 – 12 May 2017., Geneva, Switzerland

### RESEARCH INTERESTS

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|--|----------------------------|
| • Biomedical Engineering                 | • Medical Devices          |
| • Biomedical signals and Instrumentation | • Standards                |
| • Artificial Neural Network              | • Accreditation            |
| • Fuzzy Logic                            | • Testing and verification |
| • Expert Systems                         | • Metrology                |

### RESEARCH GRANTS, PROJECTS AND CONTRACTS

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1. Mutual future based on mutual interests. Project leader (Bosnia and Herzegovina Medical and Biological Engineering Society). United Nations in Bosnia and Herzegovina. Program Dialogue for the Future: Promoting Coexistence and Diversity in BiH. (2014-2017).
2. TAIEX Regional Workshop on Biomedical Engineering (Biomedical Signals, Medical Physics, Nanotechnology, Biosensors, Genetics, Renewable Energy Sources). European Commission. (February – December 2018)
3. International Conference on Medical and Biological Engineering in Bosnia and Herzegovina (IEEE/IFMBE CMBEBIH)

### PROFESSIONAL SCIENTIFIC SERVICES

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#### Conference Responsibilities

**Reviewer**

1. IEEE Mediterranean Conference on Embedded Computing (MECO), 2017, Montenegro
2. IEEE International Conference on Information, Communication & Automation Technologies (ICAT), 2017, Bosnia and Herzegovina
3. European Medical and Biological Engineering Conference (EMBEC), 2017, Sweden

**PROFESSIONAL/ACADEMIC HONOURS AND AWARDS**

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2018 IFMBE, Clinical Engineering Manuscript Award 2018

**SCHOLARLY AND PROFESSIONAL AFFILIATIONS**

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- Member, Institute of Electrical and Electronics Engineers (IEEE)
- Member, International Federation on Medical and Biological Engineering (IFMBE)
- Member, European Alliance for Medical and Biological Engineering & Science (EAMBES)
- Secretary General, Bosnia and Herzegovina Medical and Biological Engineering (DMBIUBIH)
- President of Local Organizing Committee, IEEE/IFMBE CMBEBIH 2017 Conference
- Member, IEEE Engineering in Medicine and Biology Society

**REFERENCES**

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International Burch University Sarajevo  
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**Prof. Dr. Eddie Custovic, Ph.D.**

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