

**Universitatea Tehnică „Gheorghe Asachi” din Iași**  
**Facultatea de Electronică, Telecomunicații și Tehnologia Informației**  
**Departamentul de Electronică Aplicată și Sisteme Inteligente**

Tematica și Bibliografia pentru postul didactic scos la concurs în semestrul al 2-lea al anului universitar 2024-2025, post de Profesor universitar, poziția 2 din Statul de funcții din cadrul departamentului de Electronică Aplicată și Sisteme Inteligente

**Tematica concursului:**

*Soluții de Inteligență Artificială pentru Optimizarea Proceselor*

1. Optimizarea Aplicațiilor Medicale
  - 1.1. Detecție de imagini pentru identificarea de patologii medicale
  - 1.2. Proiectarea, fabricarea și testarea de dispozitive IoT pentru monitorizarea cardiacă în sănătate
  - 1.3. Monitorizarea activității cardiace bazată pe IoT
2. Soluții de Modelare Epidemiologică
3. Soluții de Analiză în Cardiologie cu Ajutorul “Sentiment Analysis”
  - 3.1. Soluții de detecție precoce a nivelului de oboseală și stres prin analiza parametrilor variabilității ritmului cardiac
4. Metode de Colectare de Date Medicale prin Dispozitive IoT
  - 4.1. Concept și Teorie a Funcționării Sistemului de Monitorizare Telecare-ECG
5. Soluții pentru Optimizarea Transportului Feroviar – Componente de Tip IoT

**Bibliografie:**

1. Zhou, S., & Wang, Y. (2023). Artificial Intelligence in Healthcare: Past, Present and Future. Springer.
2. Razzak, M. I., Imran, M., & Xu, G. (2022). Deep Learning in Healthcare: Paradigms and Applications. Elsevier.
3. Mao, Y., Zhang, K., & Li, X. (2023). Edge Artificial Intelligence for Internet of Things. Wiley.
4. Albahli, S., et al. (2023). "Deep learning applications in medical imaging: recent advances and future trends." *Frontiers in Artificial Intelligence*, 6:1162091. <https://doi.org/10.3389/frai.2023.1162091>
5. Rani, A., & Chauhan, D. (2022). "IoT-Based Smart Health Monitoring System Using ECG Signals and Machine Learning." *Journal of Healthcare Engineering*, 2022. <https://doi.org/10.1155/2022/6744980>
6. Mansour, R. F., & Escorcia-Gutierrez, J. (2023). "AI-Driven Sentiment Analysis for Medical Diagnosis Support." *Computer Methods and Programs in Biomedicine Update*, Vol. 3. <https://doi.org/10.1016/j.cmpbup.2023.100111>
7. Sharma, G., et al. (2023). "Fatigue Detection Using HRV and Machine Learning Algorithms." *Biomedical Signal Processing and Control*, 82:104622. <https://doi.org/10.1016/j.bspc.2022.104622>
8. Patel, K., et al. (2021). "AI-Based Predictive Maintenance System for Railways Using IoT and Cloud Computing." *IEEE Transactions on Intelligent Transportation Systems*, 22(9), 5632–5642. <https://doi.org/10.1109/TITS.2021.3065272>

Decan,  
Prof. univ. dr. ing. Daniela Tărniceriu

Director departament,  
Conf. dr. ing. Cristian Aghion

**Technical University ‘Gheorghe Asachi’ of Iași  
Faculty of Electronics, Telecommunications and Information Technology  
Department of Applied Electronics and Intelligent Systems**

Topics and Bibliography for the position of Professor, position 2 of the Department of Applied Electronics and Intelligent Systems

**Competition topics:**

Artificial Intelligence Solutions for Process Optimisation

1. Optimisation of Medical Applications
  - 1.1. Image sensing for identification of medical pathologies
  - 1.2. Design, fabrication and testing of IoT devices for cardiac monitoring in healthcare
  - 1.3. IoT-based cardiac activity monitoring
2. Epidemiological Modelling Solutions
3. Solutions in Cardiology with the Help of ‘Sentiment Analysis’
  - 3.1. Solutions for Early Detection of Fatigue and Stress Level by Analysing Heart Rate Variability Parameters
4. Methods of Medical Data Collection by IoT Devices
  - 4.1. Concept and Theory of Operation of Telecare-ECG Monitoring System
5. Solutions for Rail Transport Optimisation - IoT Components

**Bibliography:**

1. Zhou, S., & Wang, Y. (2023). Artificial Intelligence in Healthcare: Past, Present and Future. Springer.
2. Razzak, M. I., Imran, M., & Xu, G. (2022). Deep Learning in Healthcare: Paradigms and Applications. Elsevier.
3. Mao, Y., Zhang, K., & Li, X. (2023). Edge Artificial Intelligence for Internet of Things. Wiley.
4. Albahli, S., et al. (2023). ‘Deep learning applications in medical imaging: recent advances and future trends.’ Frontiers in Artificial Intelligence, 6:1162091.  
<https://doi.org/10.3389/frai.2023.1162091>
5. Rani, A., & Chauhan, D. (2022), "IoT-Based Smart Health Monitoring System Using ECG Signals and Machine Learning." Journal of Healthcare Engineering, 2022.  
<https://doi.org/10.1155/2022/6744980>
6. Mansour, R. F., & Escorcia-Gutierrez, J. (2023). ‘AI-Driven Sentiment Analysis for Medical Diagnosis Support.’ Computer Methods and Programs in Biomedicine Update, Vol. 3.  
<https://doi.org/10.1016/j.cmpbup.2023.100111>
7. Sharma, G., et al. (2023). ‘Fatigue Detection Using HRV and Machine Learning Algorithms.’ Biomedical Signal Processing and Control, 82:104622. <https://doi.org/10.1016/j.bspc.2022.104622>
8. Patel, K., et al. (2021). ‘AI-Based Predictive Maintenance System for Railways Using IoT and Cloud Computing.’ IEEE Transactions on Intelligent Transportation Systems, 22(9), 5632-5642.  
<https://doi.org/10.1109/TITS.2021.3065272>

Dean,  
Prof. univ. dr. eng. Daniela Tărniceriu

Head of Department,  
Assoc. Prof. dr. eng. Cristian Aghion