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# Anas Toma

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## EDUCATION

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|---|-----------------------------|------|
| <b>Dr-Ing. Computer Engineering</b><br>• Department of Informatics, Karlsruhe Institute of Technology (KIT), Karlsruhe, Germany | Very good (magna cum laude) | 2016 |
| <b>M.Sc. Computer Engineering</b><br>• Jordan University of Science and Technology, Irbid, Jordan.                              | Very good                   | 2008 |
| <b>B.Sc., Computer Engineering</b><br>• An-Najah National University, Nablus, Palestine   | Very good                   | 2005 |

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## EXPERIENCE

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| <b>Vice President for Innovation and Artificial Intelligence</b><br>An-Najah National University, Nablus, Palestine | January<br>2026 - Now     |
| <b>Director of the Artificial Intelligence Unit</b><br>An-Najah National University, Nablus, Palestine              | April 2025 -<br>Now       |
| <b>Program coordinator</b> of M.Sc. Artificial Intelligence<br>An-Najah National University, Nablus, Palestine      | Aug. 2020 -<br>2024       |
| <b>Assistant professor</b> , Computer Engineering Department<br>An-Najah National University, Nablus, Palestine     | Aug. 2019 -<br>Now        |
| <b>Postdoctoral researcher</b><br>Technical University of Dortmund (TU Dortmund), Germany                           | Jan. 2016 –<br>July. 2019 |
| <b>Research associate</b><br>Karlsruhe Institute of Technology (KIT), Germany                                       | Oct. 2011 -<br>Dec. 2015  |
| <b>System administrator</b><br>Language center, Karlsruhe Institute of Technology (KIT), Germany                    | Jan. 2014 –<br>Dec. 2015  |
| <b>Lecturer</b><br>Computer engineering department, An-Najah National University, Palestine                         | Aug. 2008 -<br>Apr. 2011  |
| <b>Teaching and research assistant</b><br>Computer engineering department, An-Najah National University, Palestine  | Aug. 2005 -<br>Aug. 2006  |
| <b>Oracle database developer</b><br>Delta Informatics, Amman, Jordan  | June - Sept.<br>2004      |
| <b>Oracle database development course</b><br>Computer and Communications Systems (CCS), Amman, Jordan               | June - Aug.<br>2004       |

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## AWARDS

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| • <b>3rd Place Award</b> , 12th Annual NYUAD International Hackathon for Social Good and Quantum Computing, New York University Abu Dhabi | 2024 |
| • <b>Short-Term Research Grant</b> , Laval University, Canada - Palestinian Quebeceer   | 2023 |

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## Science Bridge

- **Joint Research and Education Program**, Forschungszentrum Jülich, Germany – Palestinian German Science Bridge PGSB 2023
- **DAAD Re-invitation Program** for Former Scholarship Holders 2022
- **Second Place Regional Winner**, OpenCV AI Competition 2021 2021
- **Best Paper Award**, the 11<sup>th</sup> International Conference on Bio-inspired Systems and Signal Processing (BIOSIGNALS/BIOSTEC) 2018
- **Research Grant** for Doctoral Candidates and Young Academics and Scientists (DAAD) 2011 - 2015
- Third Country **Scholarship** for Postgraduate Studies (DAAD) 2006 - 2008
- **Second Position** in B.Sc. of computer engineering, An-Najah University, Palestine 2005
- **Tuition Fees Waiver Award** for Outstanding Students, An-Najah National University, Palestine 2000 - 2005

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## RESEARCH INTERESTS

- Machine learning and computer vision
- High-performance and energy-efficient scheduling
- Cloud and edge computing
- Real-time and embedded systems

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## PROJECTS

- E-Governance in Palestine and the MENA Region (INDIGO) 2021 – Now
- Global Quality-Performance Optimization in Edge Computing Systems 2021 – Now
- CIM returning experts program supported by the GIZ and ZAV 2020 – 2022
- Research project B2 within the collaborative research center SFB876 supported by the DFG 2016 – 2019
- Software campus - Implementation and evaluation of different real-time scheduling approaches for massively parallel hardware - Implementierung und Evaluierung verschiedener Echtzeit Scheduling Ansätze für massiv parallele Hardware (ESCHE) 2014 – 2015
- SPP1500-Project - Generating and Executing Dependable Application Software on UnReliable Embedded Systems (GetSURE) 2013 – 2014

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## TAUGHT COURSES

- Data Mining and Machine Learning
- Digital Image Processing
- Embedded and Cyber Physical Systems
- Learning and Intelligence in Embedded Systems – A Proseminar
- Real-time Operating System Design and Implementation
- Artificial Intelligence
- Algorithms and Computational Complexity
- Computer Programming
- Database Systems
- Digital Circuits Design
- Computer Architecture Lab
- Microprocessor Lab
- Embedded Control Lab

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## SCIENTIFIC AND SOCIAL CONTRIBUTION

- Member of the DAAD Selection/Pre-selection Committee
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- PhD & Master Scholarships in Germany for Students from Palestine
  - Higher Education Institutions for the In-Country Programme for the Palestinian Territories
  - Member of the National Steering Committee for AI in Palestine
  - Reviewer or Co-Reviewer for:
    - IEEE Design & Test
    - Transactions on Computers
    - Journal of Systems Architecture
    - Journal of Signal Processing Systems
    - IEEE Real-Time Systems Symposium (RTSS)
    - International Journal of Humanoid Robotics (IJHR)
    - Transactions on Embedded Computing Systems (TECS)
    - Design, Automation and Test in Europe Conference (DATE)
    - International Conference on Architecture of Computing Systems (ARCS)
    - Workshop on Adaptive and Reconfigurable Embedded Systems (APRES)
    - International Symposium on Low Power Electronics and Design (ISLPED)
    - International Workshop on Software and Compilers for Embedded Systems (SCOPE)
    - IEEE International Conference on Cyber-Physical Systems, Networks, and Applications (CPSNA)
    - International Symposium on Power and Timing Modeling, Optimization and Simulation (PATMOS)
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### SKILLS

- Programming languages (C++, VC++ and Java)
  - Image processing and analysis
  - Real time operating system design
  - Intelligent systems design
  - Oracle database and tools
  - Hardware design and implementation
  - Design and development of database systems
  - Graphic design
  - Network programming
  - Using Linux and Microsoft Windows operating systems
  - Others: VHDL, OpenCV, Matlab, Eclipse, Prolog, LaTeX, Photoshop, FreeRTOS, OpenCL and OpenMP.
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### LANGUAGES

- Arabic: Mother tongue
  - English: Fluent
  - German: Very good
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### REFERENCES

Available upon request.

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### PUBLICATIONS

#### **International Journal Papers:**

1. Anas Toma, Sufyan Samara, and Manar Qamhieh. **Edge Computing Systems: Modeling and Resource Optimization for Augmented Reality and Soft Real-time Applications**. Journal of Network and Systems Management 31, no. 4 (2023): 79.
2. Ahmed Alia, Mohammed Maree, Mohcine Chraibi, Anas Toma, and Armin Seyfried. **A Cloud-based Deep Learning Framework for Early Detection of Pushing at Crowded Event Entrances**. IEEE Access (2023).

3. Saleh Qanazi, Ihab Hijazi, Anas Toma, Sohaib Abujayyab, Youness Dehbi, Shaker Zabada, Xin Lif. **Covid-19 Severity and Urban Factors: Investigation and Recommendations based on Machine Learning Techniques**. PMPJ, Vol. 7, Issue 1, 2022.
4. Nuha Odeh, Anas Toma, Falah Mohammed, Yousef Dama, Farah Oshaibi, and Muna Shaar. **An Efficient System for Automatic Blood Type Determination Based on Image Matching Techniques**. Applied Sciences 11, no. 11 (2021): 5225.
5. Mikail Yayla., Anas Toma, Kuan-Hsun Chen, Jan Eric Lenssen, Victoria Shpacovitch, Roland Hergenröder, Frank Weichert, Jian-Jia Chen. **Nanoparticle Classification Using Frequency Domain Analysis on Resource-Limited Platforms**. No 19: 4138, Sensors 2019.
6. Semeen Rehman, Kuan-Hsun Chen, Florian Kriebel, Anas Toma, Muhammad Shafique, Jian-Jia Chen and Jörg Henkel. **Cross-Layer Software Dependability on Unreliable Hardware**. In IEEE Transactions on Computers (TC), no. 1, pp. 1, 2015.
7. Inad Aljarrah, Anas Toma and Mohammad Al-Rousan. **An Automatic Intelligent System for Diagnosis and Confirmation of Johne's Disease**. International Journal of Intelligent Systems Technologies and Applications (IJISTA), 2015.
8. Anas Toma and Jian-Jia Chen. **Computation Offloading for Frame-Based Real-Time Tasks under Given Server Response Time Guarantees**. Leibniz Transactions on Embedded Systems (LITES), Vol. 1, Issue 2, pages 02:1-02:21, 2014.

#### **International Conference Papers:**

9. Alaa Khater, Anas Toma and Maik Boltes. **Pose Estimation for Pedestrian Upper Bodies in Crowds**. Traffic and Granular Flow (TGF), Lyon, France, 2024.
10. Mohammad Samaaneh and Anas Toma. **Use of AI for Detection of Cracks in Masonry Historical Buildings**, 2nd Conference on Health and Retrofitting of Structures (HAROS 2024), Institut Jean Lamour, Nancy, France, September 2024.
11. Anas Toma, Juri Wenner, Jan Eric Lenssen and Jian-Jia Chen. **Adaptive Quality Optimization of Computer Vision Tasks in Resource-Constrained Devices using Edge Computing**. In the 19th Annual IEEE/ACM International Symposium in Cluster, Cloud, and Grid Computing (CCGrid 2019), Larnaca, Cyprus, May 2019.
12. Mikail Yayla, Anas Toma, Jan Eric Lenssen, Victoria Shpacovitch, Kuan-Hsun Chen, Frank Weichert and Jian-Jia Chen. **Resource-Efficient Nanoparticle Classification Using Frequency Domain Analysis**. In BVM Workshop, Lübeck, Germany, March 2019.
13. Anas Toma, Vincent Meyers and Jian-Jia Chen. **Implementation and Evaluation of Multi-Mode Real-Time Tasks under Different Scheduling Algorithms**. In the 14th annual workshop on Operating Systems Platforms for Embedded Real-Time applications (OSPERT 2018), Barcelona, Spain, Barcelona, Spain, July 2018.
14. Anas Toma, Alexander Starinow, Jan Eric Lenssen and Jian-Jia Chen. **Saving Energy for Cloud Applications in Mobile Devices using Nearby Resources**. In the 26th Euromicro International Conference on Parallel, Distributed and Network-based Processing (PDP 2018), Cambridge, UK, March 2018.
15. Jan Eric Lenssen, Anas Toma, Albert Seebold, Victoria Shpacovitch, Pascal Libuschewski, Frank Weichert, Jian-Jia Chen and Roland Hergenröder. **Real-Time Low SNR Signal Processing for Nanoparticle Analysis with Deep Neural Networks**. In the 11th International Conference on Bio-Inspired Systems and Signal Processing (BIOSIGNALS 2018), Funchal, Portugal, January 2018, **(Best Paper Award)**.

16. Anas Toma, Santiago Pagani, Jian-Jia Chen, Wolfgang Karl and Jörg Henkel. **An Energy-Efficient Middleware for Computation Offloading in Real-Time Embedded Systems**. In the 22th IEEE International Conference on Embedded and Real-Time Computing Systems and Applications (RTCSA 2016), Daegu, South Korea, August 2016.
17. Anas Toma, Jian-Jia Chen and Wei Liu. **Computation Offloading for Sporadic Real-Time Tasks**. In the 20th IEEE International Conference on Embedded and Real-Time Computing Systems and Applications (RTCSA 2014), Chongqing, China, August 2014.
18. Wei Liu, Jian-Jia Chen, Anas Toma, Tei-Wei Kuo and Qingxu Deng. **Computation Offloading by Using Timing Unreliable Components in Real-Time Systems**. In the 51st ACM / EDAC / IEEE Design Automation Conference (DAC 2014), June 2014.
19. Anas Toma and Jian-Jia Chen. **Server Resource Reservations for Computation Offloading in Real-Time Embedded Systems**. In IEEE Symposium on Embedded Systems for Real-Time Multimedia (ESTIMedia), Montreal, Canada, Oct 2013.
20. Anas Toma and Jian-Jia Chen. **Computation Offloading for Frame-Based Real-Time Tasks with Resource Reservation Servers**. In Euromicro Conference on Real-Time Systems (ECRTS), Paris, France, July 2013.
21. Semeen Rehman, Anas Toma, Florian Kriebel, Muhammad Shafique, Jian-Jia Chen and Jörg Henkel. **Reliable Code Generation and Execution on Unreliable Hardware under Joint Functional and Timing Reliability Consideration**. In IEEE Real-Time and Embedded Technology and Applications Symposium (RTAS), Philadelphia, USA, April 2013.
22. Anas Toma and Jian-Jia Chen. **Computation Offloading for Real-time Systems**. In ACM 28th Symposium On Applied Computing (SAC), Coimbra, Portugal, March 2013.