Hazem Ibrahim

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PERSONAL DATA

- Date of birth: 8-12-1983.
- Nationality: Egyptian
- Marital Status: Married.
- Languages: Arabic, English, and Deutsch.

WORK EXPERIENCE

o **GARDENA GmbH** *2016-present*
- Software developer
- Software test automation (Python/ Robot Framework/ Selenium Library)
- Hardware test automation
- Release Management
- Development of the Individual Production Identity process for Gardena smart products

2013-2016

o **Friedrich-Alexander University, Erlangen-Nuremberg, Germany. Dep. of Electrical and Electronic communication Engineering Information Technology.**
- PhD candidate in the area of RFID.
- Co-supervised three bachelor projects and one master thesis in the area of RFID.
- Cooperate with Fraunhofer IIS (Localization and communication department) in implementation of RFID readers on USRP b210 kit.

2007-2012

o **Faculty of Information and Electronics Technology, German University in Cairo (GUC), Egypt.**
- **Research assistant**
  - Co-supervise over 20 students' projects in the area of communications and digital design.
  - Co-work on different innovative projects in the area of digital design for communication systems.
- **Teaching assistant:**
  - Channel coding
  - Communication Lab (Implementation of communication systems using VHDL)
  - Digital System Design
  - Digital modulation
  - Digital Broadcasting Systems
  - Data structure (C++)
  - RF Labs
  - Digital Electronics

o **Faculty of Engineering, Electrical and Communication, Cairo University, Cairo, Egypt.** *2005-2007*
- **Teaching assistant:**
  - Computer Networking.
  - Operating Systems.

EDUCATION

o **PhD candidate** in Friedrich-Alexander University, Erlangen-Nuremberg. Dep. of Electrical and Electronic Communication Engineering Information Technology**.** *2012-Present*
Thesis title: "**Design and implementation of anti-collision algorithm for dense RFID Systems**"
The thesis supervisor: ***Prof. Dr. –Ing. Albert Heuberger***.

o **MSc.** Faculty of engineering, Cairo University, Egypt.
Thesis**:** "**Design and implementation of Reed-Solomon decoder using inversionless Berlekamp Massey Algorithm".** *2007-2010*
The thesis supervisors: ***Prof. Amin Nassar & Prof. Hossam Ali Hassan Fahmy.***

- **B.Sc.** Engineering. Electronics & Communication Department, Cairo University, Cairo, Egypt. *2000-2005*
  Bachelor Project: "**Design and Implementation of an analogue and USB video daughter boards for a DSP Kit**",
  The project supervisor: ***Prof. Serag El Din Habib.***

AWARDS, and RECOGNITIONS:

- **Final List for Best Student Paper Award in Radio Wireless Week conference 2016 for the paper**,'' Maximum Likelihood Decoding for Non-Synchronized UHF RFID Tags''
- **Final List for Best Paper Award in Smart Systech Conference 2015 for the paper,''** FFT Based Rate Estimation for UHF RFID Systems''
- **Final list student paper Award in the Fourty-Fourth Annual Asilomar conference on signals, system, and computers for the paper**: "A low Energy High Speed Reed-Solomon Decoder using Decomposed Inversionless Berlekamp-Massey Algorithm".
- **DAAD scholarship for PhD-studies** under the academic supervision of *Prof. Dr. –Ing. Albert Heuberger*, Friedrich-Alexander University Erlangen-Nuremberg.
- **Co-Supervised of two teams in Mentor Graphics undergraduate Design contest and won the First and Second Prizes.**
- **Award of Excellence in Cairo University (Cairo/Egypt).**

PRACTICAL INTERNSHIPS:

- Jan-March 2012 Fraunhofer IIS, Erlangen-Nuremberg Germany, "Localization department".
- May 2011, **Fraunhofer IIS**, Erlangen-Nuremberg, **Germany**, "Digital Broadcasting Systems".
- July 2003, **Alcatel** Egypt, NSS team.

TECHNICAL SKILLS

Main Technical Skills:	IoT, Robot Framework, SeleniumLibrary, RFID, Communication Circuits and Systems, Digital and Wireless Communications, Digital design Concepts, Embedded System Design, Computer Architecture, Computer Arithmetic.
Programming Languages:	Python, C++ and MATLAB
Electronic Design Automation (EDA) tools:	**ASIC and FPGA design Tools**: Synopsys synthesis and simulation suite, Xilinx Alliance suite, Mentor Graphics HDL Designer
Hardware Description Languages:	VHDL and Verilog.

CURRENT/PREVIOUS WORK ACTIVITIES

- **Current work Activities:**
  - Test automation for Web/iOS/Android application for Gardena smart system using Selenium2Library - Robot Framework.
  - Hardware test automation for Gardena smart system.
  - Release management of the software release process for Gardena Smart system.
  - Development for the Individual Product Registry (IPR) for the production of Gardena Smart system.

- **Previous work Activities:**
  - Solving the collision problem in the RFID system either in physical using MIMO techniques or in MAC layer by innovating accurate estimation algorithms for the number of tags and optimizing the frame length taking into consideration the physical layer effects. Some of these algorithms are implemented on the USRP B210.
  - Design and implementation of new tag compatible with EPCglobal class1 generation 2 standards on WISP 5.0.
  - Design and implementation of new multiple receive antennas reader on USRP B210.

- Implementation of a testbed for the UHF RFID systems.
- Complete RS-decoder for WIMAX system using inversionless Berlekamp Massey algorithm and synthesized on 0.13 µm IBM standard cell using Synopsys tool.
- A complete RS-decoder for DVB-t system using inversionless Berlekamp Massey algorithm on FPGA.

LIST OF PUBLICATIONS

1. **H. A. Ahmed**, H. Salah, J. Robert, A. Heuberger, "A Closed-Form Solution for ALOHA Frame Length Optimizing Multiple Collision Recovery Coefficients' Reading Efficiency," in IEEE Systems Journal, IEEE Early Access Articles.

2. H. Salah, **H. A. Ahmed**, J. Robert and A. Heuberger, "A Time and Capture Probability Aware Closed Form Frame Slotted ALOHA Frame Length Optimization," in IEEE Communications Letters, vol. 19, no. 11, pp. 2009-2012, Nov. 2015.

3. H. Salah, **H. A. Ahmed**, J. Robert and A. Heuberger, "Multi-Antenna UHF RFID Reader Utilizing Stimulated Rate Tolerance," in IEEE Journal of Radio Frequency Identification, vol. 1, no. 2, pp. 124-134, June 2017.

4. H. Salah, **H. A. Ahmed**, Joerg Ropert, and Albert Heuberger, "Performance Evaluation of Rate Estimation for UHF RFID Systems," in International Journal of RF Technologies, vol. 7, no. 2-3, pp. 87-104, Nov. 2016

5. **H. A. Ahmed**, H. Salah, J. Robert and A. Heuberger, "Time aware closed form frame slotted ALOHA frame length optimization," in IEEE Wireless Communications and Networking Conference, Doha, pp. 1-5, Oct. 2016.

6. **H. A. Ahmed**, H. Salah, J. Robert and A. Heuberger, "A closed form solution for frame slotted ALOHA utilizing time and multiple collision recovery coefficients," in IEEE Topical Conference on Wireless Sensors and Sensor Networks (WiSNet), Austin, TX, pp. 11-14, Apr 2016.

7. **H. A. Ahmed**, H. Salah, J. Robert and A. Heuberger, "An Efficient RFID Tag Estimation Method Using Biased Chebyshev Inequality for Dynamic Frame Slotted ALOHA," in Smart SysTech, European Conference on Smart Objects, Systems and Technologies, Dortmund, Germany, pp. 1-4, Sept 2014.

8. H. Salah, **H. A. Ahmed**, J. Robert and A. Heuberger, "A Study of Software Defined Radio Receivers for Passive RFID Systems," in Smart SysTech, European Conference on Smart Objects, Systems and Technologies, Dortmund, Germany, pp. 8-11, Sept 2014.

9. **H. A. Ahmed**, H. Salah, J. Robert and A. Heuberger, "A New Optimization Criteria For Frame Slotted ALOHA Utilizing Time And The Collision Recovery Coefficients," in Smart SysTech, European Conference on Smart Objects, Systems and Technologies, Aachen, Germany, pp. 1-4, Sept 2015.

10. H. Salah, **H. A. Ahmed**, J. Robert and A. Heuberger, "FFT Based Rate Estimation for UHF RFID Systems," in Smart SysTech, European Conference on Smart Objects, Systems and Technologies, Aachen, Germany, pp. 10-15, Sept 2015.

11. **H. A. Ahmed**, H. Salah, J. Robert and A. Heuberger, "Backwards compatible improvement of the EPCglobal class 1 gen 2 standard," in IEEE International Conference on RFID Technology and Applications (RFID-TA), Tokyo, pp. 114-119, Sept. 2015.

12. **H. A. Ahmed**, H. Salah, J. Robert and A. Heuberger, "A closed form solution for frame slotted ALOHA utilizing time and multiple collision recovery coefficients," in IEEE Topical Conference on Wireless Sensors and Sensor Networks (WiSNet), Austin, TX, pp. 11-14, Jan. 2016.

13. H. Salah, **H. A. Ahmed**, J. Robert and A. Heuberger, "Maximum Likelihood decoding for non-synchronized UHF RFID tags," in IEEE Topical Conference on Wireless Sensors and Sensor Networks (WiSNet), Austin,TX, pp. 89-92, Jan 2016.

14. **H. A. Ahmed**, H. Salah, J. Robert and A. Heuberger "A Closed Form Solution for Collision Recovery Aware Number of Tags Estimation", Submitted to IEEE Journal of Radio Frequency Identification.

15. **H. A. Ahmed**, Hamed Salah, Tallal Elshabrawy, and Hossam A. H. Fahmy, "A low Energy High Speed Reed-Solomon Decoder using Decomposed Inversionless Berlekamp-Massey Algorithm" IEEE Asilomar conference 2010.
"***One of the final list student paper contest at the conference***"

16. **H. A. Ahmed**, Hamed Salah, Tallal Elshabrawy, and Hossam A. H. Fahmy "Low Energy High Speed Reed-Solomon Decoder Using Two parallel Modified Evaluator Inversionless Berlekamp-Massey" IEEE International Conference on Electronics, Circuits, and Systems 2012 (ICECS).

17. Hamed Salah, **H. A. Ahmed**, Tallal Elshabrawy, and Hossam A. H. Fahmy, "Low Energy Configurable Syndrome/ Chien search Multichannel Reed Solomon Decoder" IEEE System on Chip Conference 2010 (SOCC).

PATENTS:

1. **Hazem Elsaid**, Hamed Kenawy, Robert Joerg, Albert Heuberger, Wolfram Strauß "Reader and tag", **EU Patent Application 15166768.0-1811.**

2. Hamed Kenawy, **Hazem Elsaid**, Robert Joerg, Albert Heuberger, Wolfram Strauß "RFID READER AND METHOD FOR ADJUSTING A FRAME LENGTH OF AN RFID SYSTEM COMPRISING AN RFID READER", **EU Patent Application 15166802.7-1811.**

3. **Hazem Elsaid**, Hamed Kenawy, Robert Joerg, Albert Heuberger, Wolfram Strauß " RFID Reader and Method for Recognizing RFID tags", **EU Patent Application EP16155476.1.**

4. Hamed Kenawy, **Hazem Elsaid**, Robert Joerg, Albert Heuberger, Wolfram Strauß " RFID Tag and RFID Reader " , **EU Patent Application EP16155475.3**

References:

- Prof. Dr. -Ing. Albert Heuberger **(albert.heuberger@iis.fraunhofer.de)**
- Dr. -Ing. Jörg Robert **(joerg.robert@fau.de)**
- Victor Burger **(victor.burger@husqvarnagroup.com)**