Prof. Dr. Behnam Rahnama CV–2025

Contact

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Languages

Persian: Native
English: Advanced
Turkish: Advanced
Arabic: Intermediate
Chinese: Intermediate
French: Beginner

Summary

Behnam Rahnama received his PhD (2010) and MSc (2005) in Computer Engineering at the Eastern Mediterranean University and his BSc degree - in Computer Software Engineering - (2003) at Shiraz Azad University of Iran. He has published various papers, book chapters and a couple of books in the fields of Intelligent Systems, Robotics, Semantic Web Services, Data Structures, and Security (more than 55 publications), with his research interests including Distributed Collaborative Autonomous Semantic Robotic Systems, Semantic Reasoning, and Semantic Intelligence, Efficient Hierarchical Schemas for RDBMS, Security and Cryptography, Embedded OS/Hardware for Robotics as well as partial solvation and parallelization of ultra-dense linear matrices on GPGPU based supercomputers. He is also a reviewer in several international journals and has refereed conferences in addition to co-chairing COMPSAC-MEDIS, SINCONF, IJRCS, and biannual EEECS symposiums. Within the last recent years, he has been actively working on startup companies, running and participating in establishment of incubation centers in both US and Iran. Working as a Senior Software Engineer at ScaleDB Inc. in US and Founding Medis Startup Studio as the foremost Innovation Center in Iran, in addition to receiving full professorship degree in less than 7 years after PhD, and designing the planet most powerful Exascale supercomputer with more than 3 Exaflops of computational power are some of major examples of such enthusiasm.

Skill Highlights

- Innovative & Creative
- Leadership Spirit
- Collaborative
- Optimistic
- Empathetic & Fair
- Pragmatic
- Precise
- Anticipative
- Confident
- Dynamic

Academy

Full Prof. 2016, Semantic Reasoning and Intelligence, CSU

Assoc. Prof. 2012, Parallel Computing, YOK

Asst. Prof: 2010, Cryptography and Information Security, EUL

Ph.D. 2010, Computer Engineering, Semantic Robotics, EMU

MSc. 2005, Computer Engineering, Hierarchical Databases, EMU

BSc. 2003, Computer Engineering-Software, SAU

Education

09/2005 – 02/2010	Ph.D., Computer Engineering, Eastern Mediterranean University (EMU); Thesis: Extended Open World Assumption as Core for Reasoning in Collaborative Problem Solving on Multiple Autonomous Semantic Robots; under supervision of Prof. Dr. Atilla Elçi
02/2004 – 06/2005	MSc., Computer Engineering, Eastern Mediterranean University; Thesis: A Novel Approach to Represent Hierarchical Data in Relational Database Systems; under supervision of Prof. Dr. Alexander Chefranov
09/1999 – 02/2003	BSc., Computer Engineering (Software), Shiraz Azad University; Thesis: Design and Implementation of Software and Hardware of a General Purpose Robot Controller Board Considering Common Limit Factors; under supervision of Assoc. Prof. Dr. Farrokh Koroupi

Experience

Founder and CEO of Multi Engineering Disciplines Innovative Sciences (MEDIS): 10/2015 – Present

Medis Startup Studio, Shiraz-Iran

Design and Implementation of the Petascale Phoenix Supercomputing Project: 9/2020 – 6/2023

Dean of Faculty of Engineering and Head of Computer Center at Cyprus Science University serving as a Full Professor. 09/2016 – 12/2016

Consultant to the Chairman of Internet and Communication Technology Center (ICT) at Shiraz University: 06/2015 – 09/2016

Senior Software Engineer, ScaleDB Inc. 3723 Haven Avenue, Menlo Park, CA 94025, USA: 02/2015 – 06/2015

Associate Professor in Computer Engineering at T.C. Okan University, Turkey: 09/2013 – 02/2015

European University of Lefke, Rector's Coordinator for IRI Communications: 02/2010 – 09/2013

Chairman of department of Electronics and Communication Engineering, European University of Lefke (Assistant Professor at the department of Computer Engineering): 02/2010 – 09/2013

Project Design and Implementation Center, Faculty of Engineering, Eastern Mediterranean University: 09/2009 – 02/2010

Eastern Mediterranean University Rector's Consultant's Assistant in Informatics and Campus Automation: 02/2009 – 09/2009

Full time Lecturer at Dept. of Electrical and Electronics Engineering, Cyprus International University (CIU): 09/2008 – 02/2009

Eastern Mediterranean University Rector's Consultant's Assistant in Informatics and Campus Automation: 06/2008 – 09/2008

Lecturer, Faculty of Communication and Media Studies, EMU

Full Time PhD Research Assistant (Webmaster), Dean of Faculty of Communication and Media Studies, Eastern Mediterranean University: 02/2006 – 06/2008

Full Time Research Assistant, Department of Computer Engineering, Eastern Mediterranean University (Teaching and Grading Electric and Electronic labs of Comp. Eng. Dept.): 09/2004 – 02/2006

Managing Director and Chief of Board of Directors, Ava-Afzar Co. Iran (Providing Content Management Web Services, Cryptography and Network Security, Robotics and Autonomous Agents): 02/2004 – 02/2006

Student Assistant, Department of Mechanic Engineering, Eastern Mediterranean University (Establisher and manager of Robotics Group - Mechatronic aspects): 02/2004 – 07/2004

Manager, ETec Research Institute, Iran (Dealing with Robotics, Artificial Intelligence, Multi-threaded OS for Microcontroller Systems, Web Application Programming): 09/2001 – 02/2004

Research Interests

Semantic Robotics	Distributed Collaborative Autonomous Robotic Systems, Semantic Reasoning, Semantic and Artificial Intelligence, Semantic Robotics
Computer Security	Cryptography for Client/Server Authentication and Impersonation Avoidance, ECC, Communication Security, TDE
Parallel Computing	Solving and parallelization of ultra-dense linear matrices on GPGPU supercomputers, Parallel Algorithms, Distributed Leader Election Algorithms, Multi Agent Programming, Mobile Supercomputing, Exascale Supercomputing Design
Semantic Web and Data	Context-Aware Data Processing, Native Semantic and Hierarchical Migrated Databases, Efficient Hierarchical Schemas for RDBMS
Industrial Automation	Embedded Development, Robotics, Programmable Logic Controllers, Industrial IoT

Patents

2023	B. Rahnama and F. Heiran, Multi-Purpose Expandable Computing Case with Detachable Enclosures. National Patent (ipm.ssaa.ir), Application No.: 140150140003005180, Apr. 5, 2023.
2022	B. Rahnama, E. Arianyan, D. Maleki, S.M. Nematollah-Zadeh, A. Nezarat, Hardware and Software Infrastructure Architecture for High Performance Computing with a Focus on Cloud Computing, Artificial Intelligence and Big Data Based on Hybrid of Virtual and Physical Resources. National Patent (ipm.ssaa.ir), Application No.: 140050140003006927, Jun. 16, 2022.

Journal Publications

[1] Pegah Pedramfard, Habib Zakeri, Mohammad Radmehr, Behnam Rahnama, Aliasghar Karimi; Remote Robotic Technology in Minimally Invasive Spinal Surgery: A Comprehensive Literature Review, Under Review in International Journal of Telemedicine and Applications, 2025.

[2] Habib Zakeri, Mohammad Radmehr, Farnaz Khademi, Pegah Pedramfard, Leala Montazeri, Mahshid Ghanaatpisheh, Behnam Rahnama, Parisa Mahdiyar, Saba Moalemi, Farnaz Hemati, Aliasghar Karimi; Utilizing Artificial Intelligence for the Diagnosis, Assessment, and Management of Chronic Pain; Journal of Biomedical Physics and Engineering, Shiraz University of Medical Sciences, 2023.

[3] Leila Rahnama, Asghar Rezasoltani, Minoo Khalkhali Zavieh, Behnam Rahnama, Farhang Noori-Kochi, "Reliability of new software in measuring cervical multifidus diameters and shoulder muscle strength in a synchronized way; an Ultrasonographic study", Brazilian Journal of Physical Therapy, Volume 19, Issue 4. 2015.

[4] Rahnama, Behnam; "Towards Improved Parallelism through Order Reduction of Accessing Data in nD Matrices", The Journal of Supercomputing: Volume 70, Issue 2 (2014), Page 977-986 doi:10.1007/s11227-014-1271-1 (SCI)

[5] Sari, A. Rahnama, B., Caglar, E. (2014); "Ultra-Fast Lithium Cell Charging Architecture for Mission Critical Applications", *Transactions on Machine Learning and Artificial Intelligence*, TMLAI, ISSN: 2054-7390. (Refereed International Journal)

[6] Kivanc Bilecen, Behnam Rahnama, Ender Altiok, High Performance Computing Based Smart Scan for the Identification of Species Based Unique DNA Sequences, New Biotechnology, Volume 31, Supplement, July 2014, Page S106 (SCI)

[7] Kuren, E., Rahnama, B., Sari, A. (2013); "Performance Analysis of Reactive MANET Protocols under DoS attacks", *International Journal of Networking*, ISSN: 2249-2798. (Refereed International Journal)

[8] Rahnama, B., Sari, A., Makavandi, R., (2013); "Countering PCIe Gen. 3 Data Transfer Rate Imperfection Using Serial Data Interconnect", *Special Issue of International Journal of New Computer Architectures and Their Applications*, Vol. 3, No. 1, ISSN: 2220-9085. (Refereed International Journal)

[9] Manuel Carcenac and Behnam Rahnama, Parallel Resolution of Dense Linear Systems with Cuda and Cublas, Journal of Electrical and Computer Sciences, Vol. 1, No. 1, June 2013, ISSN:1308-237X pp. 63-69 (Refereed International Journal)

[10] Sari, A. Rahnama, B. (2013); "Dynamic Source Routing Management for Mobile Networks", *Jökull Journal*, ISSN: 0449-0576. (SCI-E)

[11] Atilla Elçi and Behnam Rahnama, Ramin Bakhshi, Hamid Mir-Mohammad Sadeghi: A Novel and Simple-to-implement Friend or Foe Identification System in Multi-robot battlefield, SDU

[12] International Journal of Technological Sciences, Vol. 3, no:1(2011)., Isparta, Turkey. (Refereed International Journal)

[13] Atilla Elci, Behnam Rahnama, and Amirhasan Amintabar: Tracking Reported Vehicles in Traffic Management and Information System using Intelligent Junctions. In Special Issue on Vehicular Wireless Networks and Vehicular Intelligent Transportation Systems, Journal of Information Science and Engineering, V.26, N.3, May 2010. (SCI-E)

Conference Publications

[1] B. Rahnama, F. Heiran, "Estella: A Humanoid Robot for Enhanced Human-Robot Interaction.", 6th Shiraz International Congress on Mobile Health, 2025.

[2] B. Rahnama, F. Heiran, A. Karimi, M. Radmehr, H. Zakeri, “Revolutionizing telemedicine with Painverse: The Role of Telerobotics in Addressing the Physician Shortage”, 6th Shiraz International Congress on Mobile Health, 2025.

[3] B. Rahnama, F. Heiran, L. Rahnama; Estella Humanoid Robot: An Anatomical Replicant; 2nd World Congress on Rheumatology and Orthopedics, Paris, France, 26-27 September 2019, pp 48.

[4] B. Rahnama, H. Amoozegar, Application of robotic technology in cardiology and cardiac surgery; 7th international Kowsar Hospital Congress on “Updates of: how to approach, how to manage cardio-vascular diseases, April 2016, Shiraz, Iran

[5] B. Rahnama, Robotics in Rehabilitation; 16th Specific Spinal Physical Therapy Seminar, USWR, 23-24 December 2015, Tehran, Iran

[6] L. Rahnama, A. Rezasoltani, M. Khalkhali, F. Noori Kochi, A. Akbarzadeh, B. Rahnama; Intrarater Reliability of a New Software for Recording the Muscle Strength and Size in a Synchronized Way, 7th World Congress of Biomechanics Boston, Massachusetts July 6-11, 2014

[7] Behnam Rahnama, Yunus Kıran, Raz Dara, Countering AES static s-box attack, SIN '13 Proceedings of the 6th International Conference on Security of Information and Networks, Pages 256-260 ISBN: 978-1-4503-2498-4

[8] Arif Sari, Behnam Rahnama, Addressing security challenges in WiMAX environment, SIN '13 Proceedings of the 6th International Conference on Security of Information and Networks, Pages 454-456, ISBN: 978-1-4503-2498-4

[9] Rahnama, B., Sari, A., Makvandi, R. (2013); “Countering PCIe Gen. 3 Data Transfer Rate Imperfection Using Serial Data Interconnect”, *The IEEE International Conference on Technological Advances in Electrical, Electronics and Computer Engineering (TAEECE2013),* Vol X, May 09-11, Turkey.

[10] Behnam Rahnama, Atilla Elci, and Cankat Özermen, “Design and Implementation of Cooperative Labyrinth Discovery Algorithms in Multi-Agent Environment”, *The International Conference on Technological Advances in Electrical, Electronics and Computer Engineering (TAEECE2013),* Vol X, May 09-11, Turkey.

[11] Sari, A., Rahnama, B. (2013); “Simulation of 802.11 Physical Layer Attacks in MANET”, *The 5th International Conference on Computational Intelligence, Communication Systems and Networks (CICSyN2013)*, Volume 16, June 05-07, Spain.

[12] Sari, A., Rahnama, B. (2013); “Dynamic Route Forwarding Mechanisms in Multi-hop Wireless Networks”, *IEEE 24th International Symposium on Personal, Indoor and Mobile Radio Communications: Special Sessions (PIMRIC13)*, Volume 13, September 08-11, United Kingdom.

[13] Behnam Rahnama, Makbule Canan Özdemir, Yunus Kıran, Atilla Elçi, “Design and Implementation of a Novel Weighted Shortest Path Algorithm for Maze Solving Robots”, ESAS 2013: The 8th IEEE International Workshop on Engineering Semantic Agents - Intelligence & Robotics, Held in conjunction with COMPSAC, the IEEE Signature Conference on Computers, Software & Applications - July 22-26, 2013 - Kyoto, Japan

[14] Behnam Rahnama, Kemal Ebedi, and Hamid M. Sadeghi, “Self-Corrective Cascade Control Obstacle Avoidance and Deviation Correction System for Robotics Systems” 2013 IEEE RO-MAN: The 22nd

IEEE International Symposium on Robot and Human Interactive Communication, Gyeongju, Korea, August 26-29, 2013

[15] B. Rahnama, R. Makvandi, “Designing Energy Efficient Ultra-Dense Scalable Supercomputing Cluster for the Parallelization of the Dense Systems” Poster Presentation, Third Annual International Conference on Energy Aware Computing, organized by the Middle East Energy Efficiency Research Center (MER). 2012 ICEACB.

[16] Rahnama, R. Makvandi, “Designing Ultra-Dense Scalable GPGPU Supercomputing Node for the Parallelization of Dense Systems”, EEECS’12: 7th International Symposium on Electrical & Electronics Eng. and Computer Systems. 2012

[17] Behnam Rahnama, Atilla Elci, Shadi Metani; An Image Processing Approach to Solve Labyrinth Discovery Robotics Problem, IEEE COMPSAC 2012, 16-20 July 2012, Izmir, Turkey.

[18] Atilla Elçi, Behnam Rahnama, Reza Makvandi; Microcontroller-Based Implementation of parseKey+ for Limited Resources Embedded Applications, ACM SINCONF 2011, 14-19 November 2011, Sydney, Australia, ISBN: 978-1-4503-1020-8.

[19] A. Cellatoglu, M. Sari, B. Rahnama, K. Balasubramanian, Remote Sensing of a Geographical Environment with Portable Radars and Satellite Link, Third International Conference on Advances in Recent Technologies in Communication and Computing, ARTCom 2011, IET-Digital Lib. 14-15 Sep 201, Bangalore, India, pp: 137 – 141

[20] Elçi, A., Rahnama, B., Bakhshi, R., and Sadeghi, H. M. (2011): A Secure Scheme for Friend or Foe Identification in Battle Scene. The Third International Conference on Wireless & Mobile Networks (WiMo-2011), June 26 ~ 28, 2011, by www.airccse.org, Ankara, Turkey. (Invited talk).

[21] Peyman Aghajamaliaval, Reza Makvendi, Behnam Rahnama; Analysis of processing gain and number of symbol per slot in DS-CDMA closed loop power control systems, The 6th International Symposium on Electrical and Electronics Engineering and Computer Systems (EEECS’10), European University of Lefke, Gemikonağı, Northern Cyprus, 25-26 Nov 2010.

[22] Manuel Carcenac, Behnam Rahnama; Application to the parallelization of the resolution of a dense linear system, The 6th International Symposium on Electrical and Electronics Engineering and Computer Systems (EEECS’10), European University of Lefke, Gemikonağı, Northern Cyprus, 25-26 Nov 2010.

[23] Behnam Rahnama, Atilla Elçi, Hamid Mir-Mohammad Sadeghi, Ramin Bakhshi; Semantic Intelligent Decision Maker Self Localizing Client CLDR, The 6th International Symposium on Electrical and Electronics Engineering and Computer Systems (EEECS’10), European University of Lefke, Gemikonağı, Northern Cyprus, 25-26 Nov 2010.

[24] Behnam Rahnama, Atilla Elci, SelcukCelik; Securing RFID-Based Authentication Systems Using ParseKey+, 3rd International Conference on Security of Information and Networks (SIN'10), Sept. 7–11, 2010, Taganrog, Rostov-on-Don, Russian Federation.

[25] Atilla Elçi and Behnam Rahnama: AWGN based Seed for Random Noise Generator in ParseKey+. In Proc. Int'l Conf. on Security of Information and Networks (SIN 2009) 6-10 October 2009, Salamis Bay Conti Resort Hotel, Gazimagusa, TRNC, North Cyprus. pp: 244-248, ACM Press, 2009

[26] Behnam Rahnama, AtillaElçi, Ramin Bakhshi, Alirad Malek, and Arjang Ahmadi: Microcontroller-based AWGNG for Security Enhancement of Embedded Real-time Web Services. In Proc. 2nd IEEE

International Workshop on Real-Time Service-Oriented Architecture and Applications (RTSOAA 2009) in conjunction with 33rd COMPSAC, 20 July 2009, Seattle, WA, USA. IEEE CPS.

[27] Atilla Elçi and Behnam Rahnama, Ramin Bakhshi, Hamid Mir-Mohammad Sadeghi: A Novel and Simple-to-implement Friend or Foe Identification System in Multi-robot battlefield, 2nd International Joint Robotics Competition and Symposium (IJRCS 2009) 20-24 May at Suleyman Demirel University, Isparta, Turkey.

[28] Atilla Elci, Behnam Rahnama, Saman Kamran. (2008). Defining a Strategy to Select Either of Closed/Open World Assumptions on Semantic Robots. *COMPSAC2008*. Turku, Finland: IEEE. July 28 - August 1, 2008

[29] Elçi Atilla, Rahnama Behnam, and Bahreini Kiavash; Embedding Matrices Ontology into Math Software Engines to Support Reasoning and Mission Oriented Calculation in Developing Semantic Agents, The International Conference on Semantic Web and Web Services (SWWS'08), Monte Carlo Resort, Las Vegas, Nevada, USA (July 14-17, 2008).

[30] Atilla Elçi and Behnam Rahnama (2008): Securing the Enterprise Semantic Web Resources: Towards Secured OWL? In Proc. 10th Information Security International Research Conference (ISIRC'08), 23 – 27 June 2008, Taganrog, Russia. Vol. 1, pp: 302-308. Invited Paper.

[31] Elçi Atilla, Rahnama Behnam; Human-Robot Interactive Communication Using Semantic Web Technologies in Design and Implementation of Collaboratively Working Robots, 16th IEEE International Symposium on Robot and Human Interactive Communication, IEEE Roman 2007, 26-29 August 2007, Jeju Island, Korea, Notification of acceptance: April 30, 2007

[32] B. Rahnama and A. Elci: "ParseKey+: a Five-Way Strong Authentication Procedure as an Approach to Client/Server Impersonation Avoidance Using Steganography for Key Encryption", in Proc. the 2007 International Conference on Security and Management (SAM'07), June 25-28, 2007, Las Vegas, USA, in the federated conferences The 2007 World Congress in Computer Science, Computer Engineering, and Applied Computing (WORLDCOMP'07). pp: 97-106.

[33] Elçi Atilla, Rahnama Behnam, Applying ParseKey+ as an approach to resolve imperfect counter utilization in IEEE802.11i, International Conference on Security of Information and Networks (SIN 2007) May 8-10, 2007, Gazimagusa, TRNC, Turkey

[34] Elçi, Atilla and Rahnama, Behnam; Applying Semantic Web in Engineering a Modular Architecture for Design and Implementation of a Cooperative Labyrinth Discovery Robot, 4th FAE International Symposium on Computer Science and Engineering, European University of Lefke, 30 Nov - 1 Dec 2006, Gemikonağı, Northern Cyprus.

[35] Elçi, Atilla, Rahnama, Behnam, and Amintabar, Amirhasan; Security through Traffic Network: Tracking of Missing Vehicles and Routing in TMIS using Semantic Web Services, The Second IEEE International Conference on Technologies for Homeland Security and Safety (TEHOSS 2006) 09-13 October 2006, Istanbul, Turkey.

[36] Rahnama, Behnam and Elçi, Atilla; Upon human-robot inter communication, RO-MAN 06 Robot Companion Design Contest, Proc. the 15th IEEE International Symposium on Robot and Human Interactive Communication, 6-8 September 2006, University of Hertfordshire, Hatfield, UK.

[37] Elçi, Atilla and Rahnama, Behnam; XMLEase: A Novel Access- and Space-Efficiency Model for Maintaining XML Data in Relational Databases, 2006 International Conference on Semantic Web and Web Services (SWWS'06) June 26-29, 2006, Las Vegas, USA

[38] Rahnama, Behnam and Elçi, Atilla; A Novel No-Latency and Simple-to-Implement Packet Loss Recovery Technique for Multimedia Streams, ISCN 2006 IEEE 7th International Symposium on Computer Networks, (ISCN'06), 16-18 June 2006, Istanbul, Turkey.

[39] Elçi, Atilla and Rahnama, Behnam; Intelligent Junction: Enhancing Quality of Life through Traffic Management, Proc. YvKB'06 4th Congress on Informatics in Built and Municipality, Ankara, 8-9 June 2006, p.: 67-74, TBD Publications, ISBN: 9944-5291-0-9 (in Turkish).

[40] Elçi, Atilla and Rahnama, Behnam; XML Ease- A Speed Efficient Approach to Courseware Data Representation in Relational Databases, Proc. 6th International educational Technology Conference", IETC 2006, Vol. 2, pp: 634-643, 19-21 April 2006, Gazimagusa, Northern Cyprus.

[41] Elçi, Atilla and Rahnama, Behnam; Considerations on a new Software Architecture for Distributed Environments using Autonomous Semantic Agents, Proc. 29th COMPSAC, IWSC 2005, 26-28 July 2005, Edinburgh, UK, IEEE Press, ISBN: 0-7695-2413-3, ISSN: 0730-3157, pp.: 133-138.

[42] Elçi, Atilla and Rahnama, Behnam; ParseKey, a New Approach to Unbreakable Secure Authentication Service, ABG2005, National Symposium on Network and Information Security, pp.108-113, 9-12 June 2005, Istanbul, Turkey.

Books and Book Chapters

[1] Hierarchical Data in RDBMS: A New Horizon for Data Storage and Retrieval, Behnam Rahnama, LAP LAMBERT Academic Publishing (September 2011), ISBN-13: 978-3846517604 Available online at Amazon.com

[2] Behnam Rahnama, Arif Sari, and Marwan Yassin Ghafour; Solving SSL Security Vulnerability by Applying ECC Authentication, Handbook of Research on Network Security Attacks and Countermeasures. (2015)

[3] Behnam Rahnama, Arif Sari, and Raz Dara Amin; Countering AES Vulnerabilities, Emerging Security Solutions Using Public Key and Private Key Cryptography: Mathematical Concepts. (2015)

[4] Birim Balci Demirci, Behnam Rahnama, and Atilla Elçi; New Trends in Semantic Oriented Cloud Based Educational Systems Handbook of Applied Learning Theory and Design in Modern Education. (2015)

[5] Sari, A., Rahnama, B., "Security Issues in Mobile Wireless Networks", Security for Multi-hop Wireless Networks, Averbach Publications, Taylor & Francis Group, January 2013.

[6] A. Elçi & B. Rahnama (2009): Semantic Robotics: Cooperative Labyrinth Discovery Robots for Intelligent Environments. In Complex Systems in Knowledge-Based Environment: Theory, Model, and Application (Editors: A. Tolk & L. C. Jain) in Series: Studies in Computational Intelligence, Vol. 168 by Springer Publishing. 272 p. 113 illus., Hardcover. ISBN: 978-3-540-88074-5. pp: 163-198.

[7] Atilla Elçi and Behnam Rahnama (2009): Towards Semantically Intelligent Robots. In Advances in Human-Robot Interaction, ISBN 978-953-7619-X-X. In-TECH Publishers.

Supervised Theses

PhD Theses:

[1] Reza Makvandi (EMU), Design and Implementation of Ultra-Dense scalable GPGPU Supercomputing node for the parallelization of the resolution of a dense linear system, Doctor of Philosophy, Eastern Mediterranean University (Discontinued September 2013)

[2] Meltem Kurt (Kocaeli), Design and Implementation of Semantic Reasoning Engine based on Four-Valued Logic, Doctor of Philosophy, Eastern Mediterranean University (Discontinued September 2013)

[3] Mohsen Mohammadi (EMU), Secure Data and Voice Communication Protocol over Cellular Network, Doctor of Philosophy, Eastern Mediterranean University (Continuing)

MSc Theses:

[1] Marwan Ghafour (EUL), Countering RSA imperfection using Elliptic Curve Cryptography Technique, Master of Science in Computer Engineering, European University of Lefke (Graduated 2013)

[2] Raz Dara (EUL), Countering AES S-Box Vulnerability, Master of Science in Computer Engineering, European University of Lefke (Discontinued May 2013)

[3] Kemal Ebedi (EUL), Self-Corrective Cascade Control Obstacle Avoidance and Deviation Correction System for Robotics Systems, Master of Science in Electrical and Electronic Engineering, European University of Lefke (Graduated 2012)

[4] Roghayeh Dehghani (SRBIAU), Implementation of $ALCK_{EF}$ Reasoning Engine through Pellet for Semantic Web based Information Retrieval, Science and Research Branch Azad University of Tehran (Graduated 2012)

[5] Reza Makvandi (EMU), Microcontroller-based Implementation of ParseKey+: a Multi-Way Strong Authentication Procedure as an Approach to Client/Server Impersonation Avoidance for Embedded Applications, Master of Science in Electrical and Electronics Engineering, Eastern Mediterranean University (Graduated 2011)

[6] Cankat M. Özermen (EUL), Implementation of $ALCK_{EF}$ as Core of Decision Making in Collaborative Micro-mouse Robotics, Master of Science in Computer Engineering, European University of Lefke (Graduated 2011)

[7] Andyson Utomudo (EUL), Design and Implementation of Digital Menu for Restaurants, European University of Lefke (Graduated 2011)

[8] Ibukun Eweoya (EUL), Countering Vulnerabilities of Advanced Encryption Standard (AES), European University of Lefke (Graduated 2011)

[9] Shadi S. M. Metani (EUL), Cooperative Labyrinth Discovery Robotics based on Solving Uncharted Maze through Image Processing Techniques, European University of Lefke (Graduated 2011)

[10] Mustafa Sarı (EUL) Design and Implementation of Self-Powered Remote Sensing Nodes with Ability of Transmitting Acquired Data Over Satellite, European University of Lefke (Discontinued 2011)

Given Courses

Undergraduate:

- Computing Foundations / Introduction to Computer Engineering
- Programming in C
- Analysis of Algorithms
- Data Structures
- Operating Systems
- Programming Languages Design
- Object Oriented Programming
- Internet and Multimedia
- Programmable Logic Controller
- Microprocessor
- Computer System Organization and Architecture
- Software Engineering

- Artificial Intelligence
- Introduction to Robotics
- Database Security
- Embedded System Design

Postgraduate:

- Parallel and Distributed Programming
- Cryptography and Network Security
- Advanced Topics in Robotics
- Computer Communication and Network
- Advanced Computer Architecture
- Semantic Web

Academic Activities

Served as:

- Establisher of CUDA Research and Teaching Centers, ACM, and IEEE Student Branches, Cognitive Robotics and Supercomputing Laboratories at Okan University in September 2013.
- Chiar, MES2015 Mobile and Embedded Supercomputing Workshop in conjunction with COMPSAC2015.
- Formatting manuscripts of the Journal of Electrical and Computer Sciences, Vol 1, No. 1, June 2013, ISSN:1308-232X.
- Program Committee, COMPSAC 2013, and Co-Chair at SINCONF2013, ESAS 2013, IJRCS2013.
- Associate Editor, The 6th International Symposium on Electrical and Electronics Engineering and Computer Systems (EEECS'10), European University of Lefke, Gemikonağı, Northern Cyprus, 25-26 Nov 2010.
- Volunteers, Internet Presence, and Exhibits Chair of International Conference on Security of Information and Networks (SIN 2007) http://www.sinconf.org/ 8-10 May 2007
- Assistant Chair of International Joint Robotics Competition (IJRC 2008) 15-17 May 2008, Famagusta, North Cyprus. http://www.ijrcs.org/
- Formatting and Arrangement of "Security of Information and Networks" Proceedings of the First International Conference on Security of Information and Networks (SIN 2007) by Elçi, A., Ors, B., & Preneel, B. (eds.) Trafford Publishing, Canada. 2008. ISBN: 978-1-4251-4109-7.
- Symposium Co-Chair, 2nd International Joint Robotics Competition and Symposium (IJRCS 2009) 20-24 May at Suleyman Demirel University, Isparta, Turkey.
- Volunteers, Internet Presence, and Exhibits Chair, 2nd International Conference on Security of Information and Networks (SIN 2009) 6-10 October 2009, Salamis Bay Conti Resort Hotel, Famagusta, North Cyprus.

Academic Research projects

June 2024	Aria: The World's most Powerful Cloud-Based Heterogeneous Computing Center with over 3 Exaflops of Processing Power
Jan 2016	Heterogeneous Radio Frequency Wireless Sensor and Actuator Network for Controlling Uncharted Borders

June 2014	Use of the High-Performance Computing for Smart Scanning in Identification of Species Based Unique DNA Sequences
June 2012	Universal Campus Automation System (University Management System UMS)
February 2011	Design and implementation of a GPU-based supercomputer architecture
	Design and implementation of dense matrix calculation library (linear system resolution) based on CUDA CUBLAS
May 2010	Interrelating Gravitational Force and Electromagnetic Energy, (Concept Design)
June 2008	Campus Automation System based on Plone CMS and MS SharePoint
May 2008	Self-Corrective Compass Cascaded Control System for AGVs
March 2008	Cooperative Mini Fighter Robots
January 2008	Hybrid Scheme for CWA/OWA Reasoning
Feb 2006	Applying Semantic Web Technology on Cooperative Labyrinth Discovery Robots
Nov 2005	Design and implementation of 128 parallelized Pentium computers independent to OS over Ethernet, using the Message passing Interface-2 standard; under supervision of Asst. Prof. Dr. Manuel Carcenac, Computer Engineering; Eastern Mediterranean University
Nov 2005	Cooperative Labyrinth Discovery Project, Design schemes and Semantic Web Service and embedded system Architecture; under supervision of Assoc. Prof. Dr. Atilla Elçi, Computer Engineering, Eastern Mediterranean University
Oct 2005	A Neural Network Based Super-Resolution Method for Video Stream Compression and Decompression; under supervision of Asst. Prof. Dr. I. Aybay and Asst. Prof. Dr. Manuel Carcenac, Computer Engineering, Eastern Mediterranean University
Jan 2004	DaemonEX Web Interface client for the mail server configurations and DaemonEX Server, Web API mail server modules, ETec Research Institute, Iran
Jan 2004	Persian Web Mail Server using DaemonEX protocol on FreeBSD and Linux Servers

Honors and awards

2016	Full Professorship Position at the faculty of Engineering, Cyprus Science University.
2013	Associate Professorship Position in Computer Engineering

2012	IEEE Senior Membership Award, Aug. 2012
2010	Assistant Professorship Position at the department of Computer Engineering, European University of Lefke, Gemikonağı, North Cyprus.
2009	Atilla Elçi and Behnam Rahnama, The prestigious Jury's Award, "Special Prize for Technical Merit", for "Cooperative Labyrinth Discovery- Client Robots Project";2nd International Joint Robotics Competition and Symposium (IJRCS 2009) 20-24 May at Suleyman Demirel University, Isparta, Turkey.
2009	The Second Place in "Mini Sumo Teams" by the "Faithful Robots" Team; 2nd International Joint Robotics Competition and Symposium (IJRCS 2009) 20-24 May at Suleyman Demirel University, Isparta, Turkey.
2009	The Third Place in "Free Style" project category by the "Security Robot"; 2nd International Joint Robotics Competition and Symposium (IJRCS 2009) 20-24 May at Suleyman Demirel University, Isparta, Turkey.
2008	Atilla Elçi, Behnam Rahnama, Mohamad N. Sabet Jahromi, and Reza Abrishambaf Fourth Place in Innovation Project Competition for Project on Self-Corrective Compass Cascaded Control System for AGVs. Project Competition, GMTGB Teknopark, North Cyprus. 2008.
2007	"First Place" in the Free Style Category for The CLD Robot developed by my Cooperative Labyrinth Discovery Project.by 4th METU Robotics Days Competition, METU, Ankara, Turkey. 2007.
2007	Volunteers, Internet Presence, and Exhibits Chair, International Conference on Security of Information and Networks (SIN/ABG 2007) May 8-10, 2007
2006	"Special Prize for Technical Merit" for CLD Robot in the Robot Companion Design Contest; by 15th IEEE International Symposium on Robot and Human Interactive Communication (RO-MAN 06), University of Hertfordshire, Hatfield, UK. 2006.
2006	Cooperative Labyrinth Discovery (CLD) Project with the support of "the Fund for Enhancing Scientific Activity in Higher Education by the Ministry for National Education and Culture, TRNC: 7 months, budget of 8,500 YTL, started Oct. 2005; ended 30 December 2006.
2006	Fulltime Research Assistantship, Dean of Faculty of Communication, Eastern Mediterranean University (including summer semesters)
2005	Assistant of awarded project based on Autonomous Semantic Agents, Ministry of Higher Education and Culture of Northern Cyprus
2004	Fulltime Research Assistantship, Department of Computer Engineering, Eastern Mediterranean University

2003	First rank of national robotic competition - Labyrinth Discovery, Azad University of Najafabad, Iran

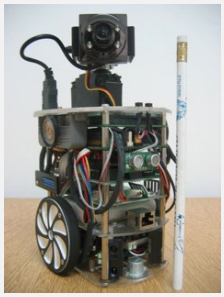
Membership of Professional societies

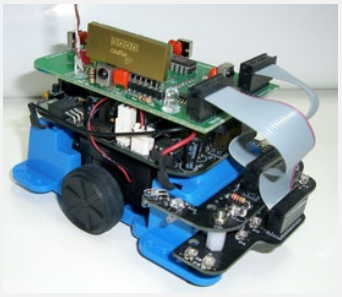
4259800	Association for Computing Machinery (ACM) brahnama@acm.org	
80505661	Institute of Electrical and Electronics Engineers (IEEE) (Senior Member) IEEE Robotics and Automation Society IEEE Computer Society	rahnama@ieee.org
IR2023SEP1784BXR	International Federation of Inventors Associations (IFIA) (IFIA Inv. Member)	

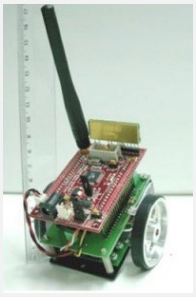
Technical Skills

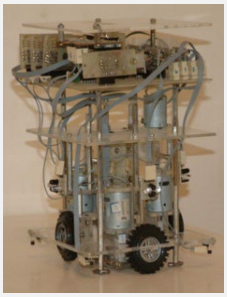
Distinctively skilled in all three major fields of computing software, hardware, and robotics. Perfectly capable of handling Operating Systems including OS X, Linux, OpenBSD, and Solaris; Graphics software including Adobe InDesign, Fireworks, and Photoshop; Embedded Systems such as Windows Embedded Standard and Embedded Linux; Electronics Tools including Proteus, Eagle. OrCAD, Protel, EWB, and Logisim; Web Development instruments including Dreamweaver, Frontpage, Sharepoint Designer and Server, CMS, Cake PHP, and iWeb; Programming Languages of VC++ .Net, OO-PHP, OWL!, C/C++, Assembly, Pascal, and Go; and IDEs including Visual Studio, Xcode, NetBeans Protégé, Eclipse and Qt; and as the last but not the least, efficiently skilled in electronics (PCB production and SMT), Mechatronics (Mounting, Milling, CNC and Spot Welding), SoC (FPGA, Vortex86, and Multicore ARM Processors), and Microcontrollers (32-bit AVR, 64-bit ARM, PIC, Intel 51 and 96 Series, and Arduino).

Glance through Labyrinth Discovery Robotics


CLD


Cruiser

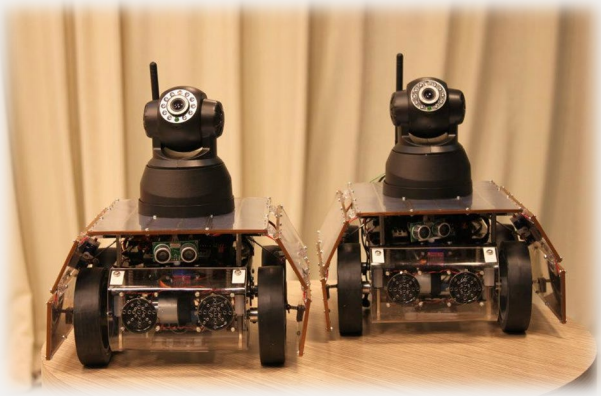

CCLDR-V2


Labyrinth


Sandwich

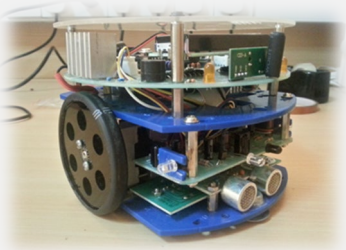
A CLDR has advanced design and development features in a small footprint, mobile, intelligent, semantic robot. They are two types of CLDRs, namely, Server CLDRs (SCLDRs AKA CLD), and Client CLDRs (CCLDRs). SCLDRs are powerful small form factor full fletched robots carrying lithium polymer battery management,

CMOS camera, and System on Chip SoC embedded boards to hold the infrastructure for installing embedded OS such as Windows Embedded Standard, powered with Wi-Fi and 433MHz Wireless transceiver etc. On the other hands, CCLDRs were designed with fewer capabilities but yet powerful enough to serve the required tasks cooperatively. Instead of developing CCLDRs from scratch, we decided to purchase ready-made cheap maze solver robots and equipped them with as many as feasible features required serving MASAs environment. The Cruiser uses Atmel Atmega8 Microcontroller with only 512 bytes of EEPROM, 8 KB of flash programmable memory and 1KB of RAM. Neither the size of flash nor RAM is suitable for the job that a CCLDR is supposed to do. Therefore, the Cooperative Labyrinth Discovery Robotics is done based on a Client-Server approach. The second design CCLDRs were made from scratch following the dynamism of inverted pendulum. In this scheme, each motor is equipped with shaft encoders as well so that an accurate movement is possible without deep consideration of localization problem. Standalone traditional schemes to solve maze includes Labyrinth and Sandwich robots. The beauty in design of the Labyrinth robot is the perpendicular movement using elevated axes connected to each two wheels to make the robot able to move perpendicularly without rotation. Other fields I work includes cooperative mini-sumo robotics, security robotics etc.



The ***Leopard GES*** Robots as shown at the left hand side, are collaborative robotics twins that aim to be multipurpose robotic platforms with a variety of features. The Atmel Pico Power Architecture allows robot to stay alive for more than 14 days. Gear-head DC motors with quadruple shaft encoders and digital compass provide the accuracy of less than 0.5 degrees deviation or a millimeter in straight run at 1 m/s speed. Robots may transfer captured data (Video with night vision, Audio, Distance, Temperature, Humidity, etc.) over Wi-Fi, Bluetooth, GSM, and USB, or store them on a micro SD card. Stereo Amplifier may deliver a transmitted voice or playback an mp3 audio or represent the text to speech engine output. Polycrystalline Cells placed on a moving wing assure the maximum charging efficiency. Additionally, The Electromagnetic Charger enables the robot to charge itself autonomously and without human interaction. Furthermore, integrated feedback brushless DC fans cool Buck and Boost switching circuits and various level voltage regulators. The color LCD and the keypad provide mid-level service oriented user interaction with the system. Programming and upgrading cannot be easier with support of the Atmel Software Framework and Atmel Studio, and on board AVR-ISP.

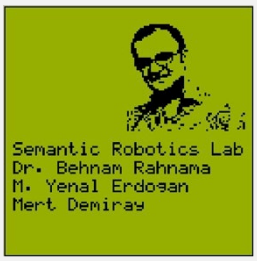
Other Robotic Projects



[1] **Blue Mouse:** In this project a compact version of CLD robot is designed for discovering the labyrinth collaboratively. Basically five multi-agent algorithms are tested namely, Weighted Shortest Path, Flood Fill, Modified Flood Fill, $ALCK_{EF}$, and Ideal. The robot keeps the discovered path in the memory avoiding unwanted moves for future decisions. In addition, Blue Mouse is able to receive commands from a superior robot such as CLD or from the host computer.

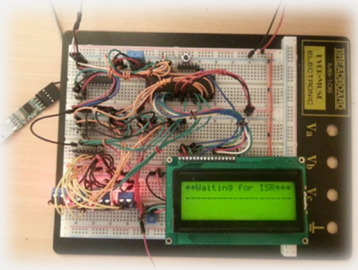
[2] **Synchronous Dancing Robots:** Three mini robots synchronously dance together. Actions are distributed through a secure wireless medium and robots act accordingly. They move at the same time and in the same way. They communicate with each other and the host computer. Other sensors control trajectory and distance to surrounding objects. Communication is secure and message delivery is guaranteed by a synchronous acknowledged messaging system uniquely defined and designed for this project.

[3] **Wireless Billboard:** A simple to implement but yet quite successful project for educational purposes is the wireless billboard. Components highlighted by power LEDs according to the selection the user makes either on the controller board or the host computer. Commands are recognized using a speech detection system and necessary routines are called in order to manage the board functionality.

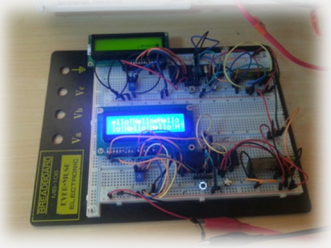


[4] **BARPA Line Following Robot:** A famous category in line following robots is where ultra fast cars try to accomplish the mission. We modified a toy car by adding a control circuitry to read line sensors and control motors. The mechanical structure of the care has been modified for faster and more accurate movements. Having a fast tracking vehicle on the line make the challenge quite difficult on sharp turns. Therefore, control mechanism s are involved to adjust the speed accordingly.

[5] **ADAMUS Ultra Fast Lithium Charging System:** This research presents design and implementation of the ultra fast parallel lithium charging architecture with an embedded algorithm using an active PWM charge pump supported by a hybrid control mechanism consisting of Temperature, humidity and current sensors. The new architecture guaranties the ultra fast parallel charging cycles of lithium cells without lifespan reduction due to possible overheating side effects in mission critical applications.

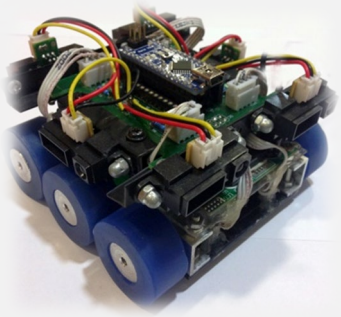


[6] **Secure Mobile Wireless Communication:** A radio frequency transceiver utilized by applications of Simultaneous Localization and Mapping (SLAM) and Identification of friend or foe (IFF). Multiple agents “work together” to achieve a task that might be too difficult for a robot to carry out alone and also to increase the speed and efficiency of the robots in carrying out a specific task. It



is not enough to send data from one robot to the other, the security of that information over wireless is also as important. AES (advanced encryption standard) is used to encrypt the payload.

[7] Okan University's students under Dr. Behnam Rahnama's supervision designed Sumokan Cooperative Minisumo Robot. Mini sumo robot was built for research and joining national and international competitions. The robot wheels are connected to 6 parallel ultra-fast gear-head dc motors. The Arduino Nano manages the robot decisions. 6 infrared range finders are used to identify opponents during the battle. Sensors are located at 4 sides of robot, giving it the ability to detect objects without turning around. Additionally, 4 infrared reflective sensors at the bottom of the robot make sure it stays on the platform.



Business and Brands

Throughout his career, Dr. Behnam Rahnama has successfully founded and raised the following brands that cover a wide range of fields starting from computer software and hardware, and mobile applications all the way to digital appliances and even food and drugs.

Medis Holding and its Subsidiaries:

Medis: Medis (Multi-Engineering Disciplines Innovative Science) was established in 2016 in pursuit of designing and developing revolutionary technologies in computer software, hardware and robotics. As a holding company's nature requires, Medis encompasses multiple (7) active dimensions including the development dimension (Raya), commerce dimension (Ravis), financials dimension (Radin), legal affairs dimension (Vandad), education dimension (Saran), advertisement dimension (Polaris) and charities dimension (Noyan); and its main policies are to maintain reliability, global accessibility and security while incorporating psychological and sociological tenets into designing cutting-edge technologies.

[1] **Raya:** As a subsidiary of the development dimension of Medis which is in fact one of its most fundamental activity dimensions, Raya is in charge of designing and developing software, hardware and robotic products. It was initially launched in 2001 as a research organization following the ultimate goal of undertaking activities in the fields of design and development of software and robotic prototypes named E-tech. Later, by obtaining the first place in IEEE ROMAN 2006, METU 2007, and IJRCS 2009 Raya became globally famous, with the Persian language webmail of Squaremail and DaemonEX controller for Fedora kernel.

[2] **Ravis:** while established to facilitate and operate the holding's commercial tasks, Ravis is also a standalone company that provides state-of-the-art trade services including import/export of goods, clearance of goods and international transportations relying on its intensive management, experienced staff and robust communications.

[3] **Radin:** Medis believes that in the current era of economic competitions, financial and accounting information are considered as the most important decision-making base for firms. Since obtaining access to the mentioned information would not be possible unless a team of expert accountants and financial advisors are associated with, Radin Finance has been launched by Medis benefiting from experienced experts in the fields of accounting, auditing, finance, tax affairs and insurance in an attempt to implement and qualitatively improve the accounting and financial information systems of institutes, firms, and factories.

[4] **Vandad:** In the current ultra-industrialized world, the new order governing social and commercial interactions has created a new set of requirements for both real and legal entities. In an attempt to satisfy these requirements Medis has established Vandaad legal office which incorporates experienced and authentic attorneys to undertake activities in the contexts of preparing and setting domestic and international contracts, completing the required correspondences for international contracts, undertaking registration affairs, intellectual property, and immigration affairs as well.

[5] **Saran:** With respect to the results of studies conducted on efficiency of taught materials in the current university system pointing to inability of graduates of most fields to enter the labor market, with a thought of interlinking industry and academy Medis tends to propose a new method of industry-oriented education which not only flattens the mentioned issue, but also results in a more desirable efficiency in terms of performance and commerce. In this regard Medis has made an effort to establish the academy of Saran which currently covers the vocational institute of Saran and Saran University of Science and Technology.

[6] **Polaris:** today advertising plays the role of an accelerator that facilitates the movement of products and services from the points of production and provision to consumption, and therefore it is considered as a fundamental variable determining the success of every business. On this basis, Medis has committed itself to enter this domain relying the most up-to-date advertising and marketing knowledge along with a team of experienced experts, following the sole aim of providing high quality services such as advertising consultation, branding, visual identity designing, brand book designing, logo designing, website development, management of social networks, and starting and managing online and offline advertising campaigns.

[7] **Noyan:** Aiming to provide education possibility at both national and international levels, granting educational subsidies and scholarships, and providing startup aids, Medis has established Noyan charity as an action sourcing from the high-held incentive of helping the mankind. Noyan is a private non-political and non-governmental charity that operates relying on the incomes generated by various dimensions of scientific and commercial activities of Medis.

Software Solutions:

[1] **Doris Bank:** Doris is a neo-currency bank based on fiat and crypto currencies, which simultaneously functions as a digital wallet and online exchange. Therefore, many users can perform all their currency and banking operations on this platform at once. In the Doris Bank platform, you can define an unlimited number of account categories or wallets, in each of which, it is possible to create financial accounts with different currencies and policies, so that the financial management of personal and business accounts can be done easily.

Dor cryptocurrency which is in fact the electronic form of money is going to develop with the aim of providing higher security as well as elimination of intermediaries. Dor uses encryption for internet-based transferring which cannot be traced or hacked considering the current technological capacities. This currency is designed for rapid application for the purposes of improving security of communications and information as well as money transfer from any point in the world to another. The block-chain structure is a 512bits encryption, and a mobile extraction engine allow all users to use this currency without requiring advanced hardware. Among the specialized features of Dor cryptocurrency, it can be referred to high security, independence from the global bank, providing buyers and sellers with guarantees for their commercial transactions, open extraction for everybody, and using a new consensus algorithm which is a combination of proof of work and proof of stacks.

[2] **Mind:** Mind ERP (Enterprise Resource Planning) is a software solution that integrates the entire activities and financial resources of various departments of an organization in a single software system. In fact, ERP is a commercial software package that aims for information integrity as well as establishing a sustainable flow of information between the entire financial, accounting, human resource, supply chain, and customer management sections of every organization. In other words, Mind ERP is an internal utility packing exclusive features such as being modular and standard as well as including a series of integrated, predesigned and pre-engineered plug-and-play modules adjustable and configurable conforming to every organization's most dynamic needs. One of the subsidiary software of the Mind ERP package is the Ariel accounting software which is an online accounting software that allows you to easily manage financial process of your business. Mind allows you to track bank accounts, stocks, bills of materials and Work orders, income and expenses. It supports multi-currency and multi languages and provides different reports. Most importantly, Mind helps you make better,

more informed decisions and stay on top of your business. Mind is proposed with different modules that can be selected based on the business requirements.

[3] **Digimenu:** Digimenu is a Multilanguage, multicurrency and multi-calendar online system suitable for provision of goods and services by the use of which everybody can run their online shop. This system, which fits roughly every job category including restaurants, shops, cafes, corporations, clinics, beauty shops, service centers, tourism centers and so on, is in fact the ultimate substitute for traditional printed menus, allowing the sellers and service providers to provide their customers and applicants with a detailed description of their products and services.

[4] **Elimedi:** As a comprehensive healthcare application aiming to propagate physical and mental health as well as self-improvement, Elimedi proposes variable facilities including online and phone consultation services, healthcare store, health profile development, guide on generic drugs and medicinal interactions, medical dictionary, mobile medical services, appointment system, and alike. Elimedi is comprised of a total of 23 sub-applications one of which is Jobino, an online employment service for employers and applicants. Another sub-application of Elimedi is Callino, an online consultation center in which consultants and experts provide their free consultation times and so the applicants can select a time to receive their consultation.

[5] **Alobodo:** Alobodo is a software solution suitable for provision of mobile services by the use of which everyone with his or her specific set of skills will be able to register ads, advertise, and attract customers. The highly simplified structure and the unique user-friendly design of Alobodo allow the users to filter their searches based on professions, requirements, and skills as well as selecting a service provider according to distance, given price, rating and received feedbacks. In addition, once received the services the users rate the provider in order to help fellow users with their choices.

Hardware Solutions:

[1] **Aria:** Medis has designed the world's largest heterogeneous supercomputing center known by the name of Aria. Owing to its +3.0 Exaflops of processing power, Aria is capable of completing extensive computations in the fields of quantum mechanics, weather forecasting, climate research, oil and gas exploration, nuclear sciences and alike. Currently a smaller version of this supercomputer, namely the A.C.E (Aria Compute Engine) is up and running in the form of an ultra-dense processing unit equipped with 2 petabytes of storage, GPGPU, ARM and FPGA processing modules in addition to conventional CPUs, giving it up to 160 teraflops of processing capacity.

[2] **Unital:** The Unital building management system is an all-modular system supporting over 500 thousand devices in the form of 256 independent boards each covering 128 sixteen-channel module cards, each of which support relays, dimmers, and various switches with capacities between 10 to 16 amperes. In addition to being modular, this system can be substituted for monitoring systems while supporting a variety of sensors including anti-thefts, contact sensors, pressure sensors, and temperature and humidity sensors as well. The distinguishing feature of the Unital BMS lies in its ability to integrate the monitoring of several separate buildings using SNMP and PRTJ protocols.

[3] **Pandora:** Pandora known as the brand of computing and cryptocurrency mining solutions in Medis. Pandora offers novel ultra-dense mining solution including ASIC miners and special case and rigs. The Pandora P0240 ASIC miner, with a maximum hash rate of 240 TH/s on SHA-256 algorithm and utilizing internal Nano-fluid cooling technology on mining chipsets without use of noisy fans is the complete solution for setting up ultra-dense mining farms. Pandora rack-mount compute cases are designed and built for mining by graphics card, or farming by hard drive or both. Pandora cases are designed in two models, S-series and U-series. The S-series comes with a specific design for better transportation which is expandable in length from 45 to 95 cm. Also, the whole parts are separated into a 50x50x10 cm package. Unlike the S-series, the U-series are not separatable in length and walls. The Pandora S Series Open-Air Chassis comes with a unique and ready-to-assemble design with the best quality of manufacturing. This chassis can assemble on each other vertically by extension parts specially to construct mining farms.

[4] **Digitouch:** The Digitouch devices are touch-screen interactive tools designed to simplify access to information, establish communications, facilitate presentations and make entertainments more fun. Digitouch Touch Screen interactive devices including the smart table, kiosk, stand and mirror are available in different screen sizes from 10 to 80 inches with various qualities up to 8k packing several interesting features namely as P.O.S, NFC and thermal printer connectivity, data presentation capability, spreading awareness about products and services, routing, navigating, viewing menus, internet browsing and gaming as well.

[5] **Echoshot:** Medis designs and develops various hardware products that fall into a variety of categories on of which is relates to professional audio and video appliances, known by the brand name of Echoshot which is described by products including IoT enabled Hi-Fi home theater, professional crossover board, and audio streamer which is known as Juke Box. As the most prominent product in this family, the Hi-Fi IoT enabled home theater of Echoshot produces 600 watts RMS

and uses a top-of-the-shelf crossover board capable of separation of sound frequencies between 15 and 22000 hertz free from any shifts and distortions.

Robotics Solutions:

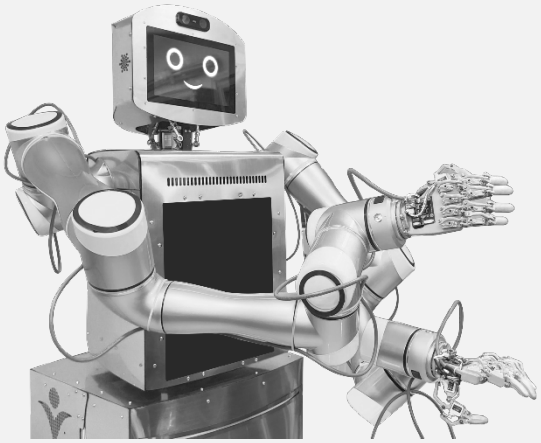
[1] **Estella:** Estella is a humanoid robot fully corresponding to human body's anatomy, designed and built by Medis. Development of this robot is inspired from the anatomy, muscle types and movement types of human body and therefore its entire motor organs and joints including the spinal cord, hands, legs and neck are designed in a way that not only the angels are conformed to, but also the robot is enabled to move along different directions.

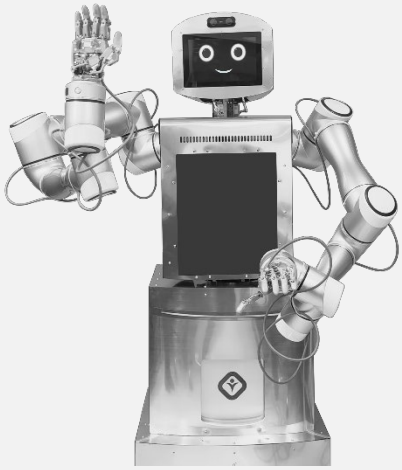
In human, the spine plays a vital role in proper gait and balance. Hence, Estella's spine is a hybrid serial-parallel structure with the S shape of the spine including four vertebrae, each of which is a parallel robot with three degrees of freedom, it is formed to cover all the movements of the robot. Furthermore, Estella's neck also has a structure similar to the vertebras of the spinal cord and cover the entire three degrees of freedom available for human neck, allowing the head to move in curved directions.

Similarly, the arm and the forearm of Estella have been built corresponding to human body's anatomy and cover the entire 7 degrees of freedom available for human arm and forearm while being able to simulate movements including depression, abduction, adduction, flexion, and lateral and medial rotation. Estella's hand is a product of the YOUBIONIC Company, but has been down-scaled to provide more delicacy. Nevertheless, the robot's wrist is able to simulate movements such as flexion, extension, radial deviation and ulnar deviation. In addition, the legs of Estella are designed in a way that the entire movements of the lower limbs of human body can be simulated similar to the way the movements of shoulder are reproduced. Ultimately it can be referred to Estella's face which is built upon four motors that enable it to simulate the entire mimics of human face.

[2] **Painverse:** Painverse is a tele-medicine project with the aim of performing examination and consult remotely from all over the world; It means that the doctor can be located in another geographical area and the patient can be examined in another geographical area. In this system, physician, two robots and patient communicate directly with each other. Painverse system contain two robots: Patient/clinic side robot for assessment and consulting in place of the doctor which is named Vira and Doctor side robot to control the Vira under the operation of doctor which is named Hira.

Painverse telerobotic system is a telemedicine solution that offers a wide range of very innovative methods of examining patients. Expandable architecture, very attractive user interface and flexible configuration are very important features of this system.





[3] **Titan:** Titan is a gadget that transmits alarms to infirm individuals about their body conditions and motor symptoms. By being placed on any part of the body, this device can be used by physicians, individuals, and experts for reading information such as heart beat rate, temperature as well as position, speed and acceleration of motor organs of the body. In addition, this gadget is equipped with a motion detector and vital sign alarm system as well. Considering its ability to process, store and transfer the data produced by Gyro-Accelerometer and Magnetometer sensors, Titan is quite effective in training proper sport movements, lifestyles, and motor skills.

[3] **Greta:** The Greta desktop 3D printer and scanner is a stand-alone IoT enabled computer device encapsulating the entire prototyping facilities laser scanning, and 3D printing in one package. This triple axis, dual nozzle printer is equipped with multiple stepper drivers capable of micro-stepping, for smooth printing operation while also supporting various filament types including PLA, ABS, Nylon, HPIS, PVA and flexible filaments as well. It prints 40x40x40 models and features a protected mode to prevent infliction of damages on the device under faulty commands. The other features of the Greta 3D printer include full-touch display and being IoT enabled, which allows the device to be controlled over the Internet.

[4] **Dorado:** The Dorado Winding Machine is a device that produces inductors. In the process of producing an inductor, wire diameter, wires' order and winding precision are of significant importance. Compared to its similar counterparts, the Dorado winding machine is not only in smaller dimensions, but is also more efficient and allows for producing Inductors with diameters up to 8 centimeters. However, the most obvious advantage of this product over its counterparts is arbitrary inductance and wire AWG inputs as well as automatic winding calculations. Among the other features of this product, it can be pointed to its network connection support as well as its ability to calculate the amount of required wire along with suitable wire length and diameter with respect to the coil's induction capacity.

Healthcare and Nutrition:

[1] **Vitocean:** Vitocean is a sugar-free real vitamin drink provides a suitable dose of vitamins needed by the body for daily consumption to the consumer. The vitamins will decompose in about 15 minutes post to solvation, therefore most claimed vitamin drinks on the market are free of vitamins in reality. Vitocean's cap with the capability of keeping the vitamin powder separated from the water until consumption have turned Vitocean into the only real vitamin drink. On this basis the Vitocean vitamin water is considered as a healthy suitable substitute for the harmful carbonated and flavored commercially available drinks.

[2] **Dietline:** Dietline is a specialized platform focused on healthy nutrition and lifestyle improvement. It provides personalized diet plans created by an experienced team of nutrition specialists, helping users maintain a diet tailored to their physical condition and lifestyle. In addition to offering free initial consultations through its support team, Dietline recommends diet-friendly meal packages, ensuring users can access healthy meals without concern. Furthermore, the platform features a dedicated online store, allowing users to purchase healthy food products conveniently.

[3] **Ostadvisit:** OstadVisit is a comprehensive online medical consultation platform that offers text, phone, video, and in-person consultations to users. This platform enables high-quality and secure video and audio visits, allowing patients to consult with their doctors remotely. Additionally, text-based consultations are available via online chat, ensuring users can quickly and easily connect with medical professionals. OstadVisit operates with an official license from the Ministry of Health, enhancing its credibility and user trust.