

Curriculum Vitae

Personal Data

Name:	Ayman El-Sayed A. Tawfik
Birth Date:	21st Nov. 1960
Profession	Associate-Professor, Dept. of Electrical Engineering, Faculty of Engineering, Ajman University of Science & Technology.
Nationality	Canadian
Marital Status:	Married
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Education:

<u>Degree</u>	<u>Institution</u>	<u>Date</u>
* Ph.D. Elec. Eng.	Univ. of Victoria, Canada	Nov. 1995
* M.Sc. Elec. Eng.	Ain Shams Univ. Cairo, Egypt	Aug. 1989
* B.Sc. (Hon.) Elec. Eng.	Ain Shams Univ., Egypt	Sept. 1983

Positions Held:

- Jan. 2017-Present
Head of Electrical and Computer Engineering Department at Ajman University.
- Sept. 2000-Dec. 2016
Associate-Professor, Ajman University of Science & Technology, Faculty of Eng., Ajman, UAE.
- March 97-August 2000
Consultant, Egetronics for Electronic Products, 10th of Ramadan, Egypt.
- March 97-Sept. 2000
Assistant-Professor, Ain-Shams University, Faculty of Eng., Dept. of Elect. & Communication, Cairo, Egypt.
- Feb. 96-March 97
Associate-Researcher, Technical University of Nova Scotia, Nova Scotia, Canada.
- Aug 95-Jan. 1996
Post-Doctoral Fellow, University of Victoria, Victoria, B.C., Canada.
- May 91-July 95
Researcher and Assistant Teacher, University of Victoria, Victoria, B.C., Canada.

- Sept.83-Apr. 91
Assistant Lecturer, Ain Shams University, Cairo, Egypt, (full-time position).

Honors and Awards

- Obtained supervision of Best student research paper in Eight Undergraduate Virtual Research Competition (URC), AbuDhabi, June 2021.
- Certificate of best student paper from 10th National Symposium of Engineering, Nazwa University, Oman, Dec. 2020.
- Obtained certificate of appreciation for valuable role as Technical chair for 19th IEEE ISSPIT 2019.
- Obtained appreciation certificate for contribution in ABET accreditation of the Electrical Engineering, 2017.
- Obtained certificate of appreciation for valuable contribution in guiding students in 12th IEEE UAE Student Day, 2017.
- Certificate of Merit for supervising the best scientific paper in 2nd Approach Students' Scientific Conference of AUST Network, May 2012.
- Certificate of Merit for supervising the best scientific paper in 2nd Approach Students' Scientific Conference of AUST Network, May 2006.
- Certificates of Appreciation for contribution in 1st and 2nd Approach Students' Scientific Conference at AUST Network, June 2005.
- Distinction with honor degree - B.Sc. in Electrical Engineering.
- Egyptian government excellence award (1980-1983).
- Graduation excellence award, Egyptian syndicate of Engineering (1983).

Teaching Experience:

Place	Courses	Type
Ajman University, Ajman, AUE.	<ul style="list-style-type: none"> - Signals & Systems. - Principles of Communication. - Communication Electronics - Digital Signal Processing. - Digital Data Communication. - Probability & Random Variables. - Wireless Communication. 	Undergraduate Courses.

	-Computer Network & Switching. - Fuzzy Logic & Neural Networks - Electronic Device I - Information Theory & Coding. - Digital Control Systems. - Satellite Communication. - Digital Image Processing. - VLSI -Digital IC	
Ain-Shams University, Cairo, Egypt.	- Logic Design. - Electronic Circuits. - Communication Theory. - Electronic Measurements. - Digital Communications. - Signal Analysis	Undergraduate Courses
Ain-Shams University, Cairo, Egypt.	- Digital Signal Processing. - Digital Communication - Satellite Communication.	Postgraduate Courses

Research & Work Experience

Jan 2017-Present:

Head of Electrical and Computer Engineering Department-Ajman University

- Technical Chair of IEEE 19th International Symposium of Signal Processing and Information Technology (ISSPIT), Ajman University, 10-12 Dec. 2019.
- Principal organizer of IEEE 19th International Symposium of Signal Processing and Information Technology (ISSPIT), Ajman University, 10-12 Dec. 2019.
- As a head of department, I was responsible of coordinating the department units for re-accreditation purposes.
- As a head of department, I was in charge of preparing the department for ABET International Accreditation.
- As head of department, I was involved in developing documents for re-accreditation and ABET International accreditation.
- As head of department, I was responsible for co-ordination with Fujairah campus for accreditation purposes.
- As a head of department, I was involved in updating all Electrical Engineering labs and the lab experiments.
- Acted as a chair for Communication Concentration Committee.
- Acted as a chair of IEEE Students Activity Committee (SAC), UAE.
- Acted as the Counselor for AU IEEE Student Branch.

- Acted as the chair of Time-Table Committee.
- Acted as the head of college Exam Committee.

Sep. 2000 to Dec. 2016:

Associate Professor, Ajman University of Science & Technology (AUST), Ajman, UAE

- 1- Tutor for different courses: wireless communication, satellite communication, coding, digital communication, communication theory, digital signal processing, signals & systems, random signals & stochastic process, computer networking, fuzzy logic & neural networks, digital control systems, electronic device I, VLSI, digital IC.
- 2- Committee member for ABET accreditation
- 3- Accreditation Coordinator for Communication Engineering.
- 4- AU IEEE SB counselor since Feb 2015.
- 5- Member of the AUST promotion committee from Sept. 2013-Aug. 2015
- 6- Local Committee Chair of International Symposium on Signal Processing and Information Technology (ISSPIT) 2009 held on Dec. 14-16, 2009 at AUST.
- 7- Chair session in_ IEEE International Symposium on Signal Processing & Information Technology (ISSPIT) ,14-16 December 2009, Ajman, UAE.
- 8- Technical Referees for International Conferences such as IEEE ISSPIT, Circuit Systems and Signal Processing
- 9- Secretary of the Council of Research, Information and Training (CRIT).
- 10- Representative of Faculty of Engineering in Council of Research, Information and Training (CRIT).
- 11- Responsible for Research file in Faculty of Engineering..
- 12- Co-author for accreditation report for Electrical Engineering.
- 13- Co-author for the Evaluation Report for EE Laboratories Equipment/Software.
- 14- Chair for the Communication Lab-updating committee.
- 15- Supervisor for many graduate student projects such as security systems, smart internet switches, smart guided parking system, smart alert car driving system, digital oscilloscope, smart shopping cart, simulation of Wimax system, simulation of OFDM systems, digital spectral analyzer, image processing,.....
- 16- Developer of different techniques for digital image watermarking.
- 17- Developer of different techniques for digital image enhancement and coding
- 18- Consultant for EGETRONIC Company in the field of wireless communication.
- 19- Co-supervisor of PhD thesis on Robust Digital Watermarking Techniques with the co-operation with Bradford Univ. in England.

Apr. 1997-to Aug. 2000:

Assistant-Professor, Ain-Shams University-Consultant for Egetronics

- 1- Consultant for EGETRONIC Company in the field of computer hardware & software.
- 2- Supervisor for M.Sc theses at the field of speech processing.
- 3- Tutor for different courses such as digital communication, electronic circuit, logic design, and DSP.
- 4- Developer for efficient techniques for image enhancement and restoration.
- 5- Analyzer of finite word-length effects for Quadrature Mirror Filter-BANK (QMF) implementation.
- 6- Designer of Laboratories for engineering underground students at Obour High-Institute of Technology.

Feb. 1996-to March 1997

Research-Associate, Technical University of Nova Scotia, Halifax, Canada

- 1- Developer of conventional and adaptive 2-D and 3-D beamforming algorithms for Sonar and Radar applications.
- 2- Developer of a generic processing structure that allows the testing and the implementation of conventional and adaptive schemes in a wide spectrum of real-time Sonar and Radar systems. The implementation of this generic structure is developed using C-language environment.

May 1991- Jan. 1996:

DSP Hardware/Systems Experience, Univ. of Victoria, British Columbia, Canada

- 1- Realized different FIR and IIR digital filters structures which perform excellent under finite wordlength effects.
- 2- Obtained efficient array-processor implementations of 1-D, 2-D, 3-D FIR and IIR digital filters which provide excellent performance in terms of speed and required area.
- 3- Obtained VLSI array-processor implementation of high-speed IIR digital filters where the achieved speed can exceed the involved processor element speed.
- 4- Designed and simulated (using Verilog) a fixed-point inner-product processor which doubles the computation speed with a slight increase in the area.
- 5- Designed and implemented two's complement controller using FPGA XILINX chip.
- 6- Participated in developing an efficient mapping technique which can be used to map many DSP algorithms onto systolic arrays.

DSP Software Experience, Univ. of Victoria, British Columbia, Canada

- 1- Built a software tool for analyzing finite wordlength effects in IIR digital filter implementation (using MATLAB environment).
- 2- Implemented several techniques used to enhance images (i.e., to remove noise with preserving the details).

DSP Chip Experience

- Implemented and tested real-time IIR filter structures using Motorola DSP56001.

Sep. 1985- Apr. 1991:

Ain Shams Univ. Cairo-Egypt:

- Implemented PASCAL code for spectral analysis of signals based on efficient filter banks structure (polyphase structure).
- Designed and implemented PCB card used to add the feature of real-time spectrum analysis for IBM-XT computer.
- Supervised student groups in designing and implementing several projects such analog spectral analyzer, traffic controller, data acquisition systems.
- Designed and implemented several experiments for undergraduate student labs (eg., electronic and communication labs).

Training Engineer, Electronic Engineering Center, Cairo-Egypt

- Designed and implemented a software code for programmable controller to be used in steel-furnace applications.
- Designed digital circuits for traffic control.

Academic Background

- Excellent background in signals & systems, digital signal & image processing, wireless communication, digital & analog communication systems, adaptive processing, and VLSI DSP.
- Good background in satellite communication, and VLSI design

Research Interests:

Digital signal processing theory and applications, digital image processing, speech coding, multirate, multidimensional, adaptive, optimum DSP, digital filter design, digital VLSI system design, VLSI signal processing, digital modulation, transmission techniques, and computer arithmetic.

Other Activities

- Reviewer for IEEE Trans. Signal Processing, IEEE Trans. Circuits Systems, IEEE Proceedings, ISCAS, IET, Midwest Symp. Circuits Syst, and many other conferences.
- Advisor of IEEE WIE Woman Affinity Group, AUST, UAE.
- Member of the IEEE and the signal processing society since 1993.
- Member of the Egyptian Syndicate of engineers since Aug. 1983.
- Referee Member for IEEE Student Day 2005-2007.

Computer Skills

Programming Languages: C, VHDL, Assembly
Operating Systems: UNIX, MS-Windows
CAD Packages: MATLAB, XACT, Cadence, MS Office

Publications

Refereed Journal Publications

1. A. Kanellakis, **A. Tawfik** and P. Agathoklis, "Inverse and Direct Solutions of the Discrete-time Lyapunov Equation with Systems Matrix in Companion Form", *IEEE Access*, 20 Dec. 2021.
<https://ieeexplore.ieee.org/document/9656752>
2. A. Kanellakis, **A. Tawfik** and P. Agathoklis, "Stability Analysis of 2-D Discrete and Continuous State-Space Systems, IET Control Theory & Applications, 1-10, 18 Nov. 2021.
<https://ieeexplore.ieee.org/document/9656752?source=authoralert>
3. M. Saeed Darweesh, Mostafa Adel, Ahmed Anwar, Omar Farag, Ahmed Kotb, Mohamed Adel, **A. Tawfik**, and Hassan Mostafa "Breast Cancer Diagnostics Based on Hierarchical Machine Learning Classification for Mammography Images, *Cogent Engineering*, July 2021.
<https://doi.org/10.1080/23311916.2021.1968324>
4. A. Kanellakis and **A. Tawfik**, "A New Sufficient Criterion for the Stability of 2-D Discrete Systems", *IEEE Access*, May 2021.
<https://ieeexplore.ieee.org/document/9424622?denied=>
5. W. Shehie, M. Assaad, **A. Tawfik**, N. Ashidi Mat Isa "Meibomian Gland Cyst Detection and Classification Using Hyperspectral Imaging", *Cogent Engineering*, Feb. 2021.
<https://www.tandfonline.com/doi/full/10.1080/23311916.2021.1883831>
6. A. Morgan, A. Hassan, M. Watheq El-Kharashi and **A. Tawfik**, "NoC2: An Efficient Interfacing Approach for Heavily-Communicating NoC-Based Systems", *IEEE Access*, volume 8, PP: 185992-186011, 22 October 2020.

<https://ieeexplore.ieee.org/document/9220872?source=authoralert>

7. M. Noman, V. Stankovic, and **A. Tawfik**, "Portable Offline Indoor Object Recognition System for the Visually Impaired", *Cogent Engineering*, 23 Sept 2020.
<https://www.cogentoa.com/article/10.1080/23311916.2020.1823158>
8. F. Guibaly, M. Taher, A. Zaki, M. Watheq El-Kharashi and **A. Tawfik**, "Parallel Multidimensional Lookahead Sorting Algorithm", *IEEE Access*, Volume 7, PP. 75446 – 75463, 5 June 2019.
<https://ieeexplore.ieee.org/document/8731843>
9. A. Al-Gindy, H. Al-Ahmad, R. Qahwaj, and **A. Tawfik**, "A New Watermarking Scheme for Colour Images Captured by Mobile Phone Cameras," *IJCSNS International Journal of Computer Science and Network Security*, vol. 9, pp. 248-254, July 2009.
10. **A. Tawfik**, "An Efficient Implementation of Planar and Cylindrical Adaptive Beamforming", *Scientific Bulletin, Ain-Shams Univ. Faculty of Engineering*, Vol. 38, No. 1, 2003.
11. **A. Tawfik** and S. Stergiopoulos, "A Generic Processing Structure Decomposing the Beamforming Process of 2-D & 3-D Arrays of Sensors into Sub-Sets of Coherent Processes ", *J. Acoust. Soc. Am.* Oct. 1998.
12. A. Kallinaklis, P. Agathoklis and **A. Tawfik**, "A Note on the Orthogonal Realization of All-Pass Digital Filters and Their Finite Wordlength Effects", *IEEE Trans. on Signal Processing*, Vol. 44, pp. 2616-2619, Oct. 1996.
13. F. El-Guibaly and **A. Tawfik**, "Mapping 3-D IIR Digital Filter onto Systolic Arrays", *Multidimensional Systems and Signal Processing* 7, pp. 7-26, 1996.
14. **A. Tawfik**, F. El-Guibaly, and P. Agathoklis, "Systolic Implementation of Fixed-Point State-Space Digital Filter", *IEE Proc. Pt. G*, pp. 193-199, June, 1995.
15. **A. Tawfik**, P. Agathoklis, and F. El-Guibaly, "New Low Roundoff Noise Realization of Second-Order IIR Digital Filter", *IEEE Trans. Signal Processing*, pp. 1255-1258, May 1995.
16. **A. Tawfik**, F. El-Guibaly, M. Fahmi, E. Abdel-Raheem and P. Agathoklis, "High-Speed Area-Efficient Inner-Product Processor", *Canadian Journal of Electrical Engineering*, pp. 187-191, Oct. 1994.

Refereed Conference Publications

- 1- M. Alansari, E. Al-Ali, M. Balouch, K. Almakrashi, **A. Tawfik**, W. Sheheib, “ Injury Identification Using Video Magnification”, 10th National Symposium on Engineering Final Year Project”, Oman, 15 Decemeber 2020.
- 2- W. Sheheib, M. Asaad, **A. Tawfik** and Nor Ashidi,“Analysis and Recovery Monitoring of Meibomian Gland Dysfunction Disease Using Hyperspectral Imaging”, 19th IEEE ISSPIT, 10-12 Dec. 2019.
- 3- M. Noman, V. Stankovic, and **A. Tawfik**, “Object Detection Techniques: Overview and Performance Comparison”, 19th IEEE ISSPIT, 10-12 Dec. 2019.
- 4- G. Fahmy, Illiasu, **A. Tawfik**, “Automatic Seizure Detection in Face-Based Video Based on CWT”, *IEEE ISSPIT 2018*, Louisville, Kentucky, USA from 6-8 December 2018.
- 5- M. Rahman, M. Subashimi, M. Nasor and **A. Tawfik**, “Development of Bio-Shields for Arduino Uno”, 2018 Advances in Science and Engineering Technology International Conferences (ASET), Feb. 2018.
- 6- **A. Tawfik**, Asmaa Awad, Mobile Phone Applications for *Education*” 3rd International Conference on Learning and Teaching, April 7-9, 2017, South Korea.
- 7- **A. Tawfik**, Asmaa Awad, and Tarek Jamal, “Using Smart Phones in Education” 12th Annual Educational and Development Conference, 5-7 March 2017, Bangkok, Thailand.
- 8- **A. Tawfik**, “Efficient Watermark Registration Technique for Monochrome Images”, *IEEE 15th ISSPIT*, Abu Dhabi UAE, Dec. 2015
- 9- **A. Tawfik**, Faysal Djeddi, Sami Sami, M. Mhanna and Abdalla Yousif, “Efficient Registration Technique for Watermarked Biomedical Images”, *URC 1-2* May 2013, Zayed University, Dubai, UAE.
- 10- **A. Tawfik**, Mussab Saleh Hassan, Mohammed Maher, Faisel Hashem, Nasser salah, " Orthogonal Frequency Division Multiplexing Techniques for Long Term Evolution Fourth Generation Mobile Systems", *URC 18-19* April 2012, Zayed University, Dubai, UAE.
- 11- A. Al-Gindy, H. Al-Ahmad, R. Qahwaj, and **A. Tawfik** "A High Capacity Digital Watermarking Techniques for the Authentication of Colour Images ", *IEEE International Symposium on Signal Processing & Information Technology (ISSPIT)* ,14-16 December 2009, Ajman, UAE.
- 12- A. Al-Gindy, H. Al-Ahmad, R. Qahwaj, and **A. Tawfik** "A New Watermarking Scheme For Colour Images Captured By mobile Phone Cameras", *The ninth TED International Conference Visulaization, Imaging and Image Processing*, 13-15 July 2009, Cambridge, United Kingdom.
- 13- A. Al-Gindy, H. Al-Ahmad, R. Qahwaj, and **A. Tawfik** "A frequency Domain Adaptive Watermarking Algorithm For Still Colour Images", *International Conference on Advances in Computational Tools For engineering Applications*”, 15-

17 July, Lebanon 2009

- 14- A. Al-Gindy, H. Al-Ahmad, R. Qahwaj, and **A. Tawfik** "A Novel Blind Image Watermarking Technique for Colour RGB Images in the DCT Domain Using Green Channel", in *Mosharaka International Conference on Communications, Computers and Applications (MIC-CCA 2008)* , Amman
- 15- A. Al-Gindy, **A. Tawfik**, H. Al-Ahmad and R. Qahwaji "Color Image Watermarking Using DCT Technique", *IEEE International Conference on Electronics, Circuits & Systems (ICECS)*, Malta, August 31st-3rd September 2008.
- 16- A. Al-Gindy, **A. Tawfik**, H. Al-Ahmad and R. Qahwaji "A New Blind Image Watermarking of Handwritten Signatures using Low Frequency Band DCT coefficients ", *IEEE International Conference on Signal Processing and Communications (ICSPC 2007)* , Dubai, United Arab Emirates (UAE) on 24–27 November 2007.
- 17- A. Al-Gindy, H. Al-Ahmad, **A. Tawfik** and R. Qahwaji "A New Blind Image Watermarking Technique For Dual watermarks using Low Frequency Band DCT Coefficients. ", *14th IEEE International Conference on Electronics, Circuits and Systems*, Marrakech, Morocco on December 11-14, 2007.
- 18- A. ElGindy, **A. Tawfik**, H. Al-Ahmed, and R. Qahwaji "Enhanced DCT Based Technique with Shuffle Scheme for Robust Image Watermarking" *International Conference on Communication, Computer and Power ICCCB'07*, Muskat, Oman, pp. 455-458, Feb. 2007.
- 19- S. El-Ramly, **A. Tawfik**, and M. Masoud, "A Rate—Determination Algorithm for Variable-Rate Speech Coder", Sept. 2004.
- 20- M. Merette, S. El-Ramly and **A. Tawfik**, " An Enhanced Variable Bit-Rate CELP Speech Coder", *IEEE Pacific Rim Conference on communication, computers & Signal Processing (PACRIM'03)*, Victoria, Canada, 2003.
- 21- **A. Tawfik**, "An efficient Implementation of Planar and Cylindrical Adaptive Beamforming", *Scientific Bulletin, Ain-Shams university, Faculty of Engineering*, Vol. 38, Cairo, Egypt, 2003.
- 22- M. Mirete, S. El-Ramly, and **A. Tawfik**, " A New CELP Speech Coder for Wireless Communication", *14th International conference on Digital Signal Processing*, Santorini, Greece, 2002.
- 23- E. Abdel-Raheem, **A. Tawfik** and F. El-Guibaly, "Effects of Finite Word Length in Two-Channel QMF Banks", *IEEE Symposium on Advances in Digital filtering and Signal Processing*, Victoria, B.C., Canada, pp.144-148, June 1998.
- 24- **A. Tawfik** and Esam Abdel-Raheem, " Design of Two-Channel QMF Banks Satisfying Prescribed Specifications", *The Fifteenth National Radio Science Conference NRSC*, Cairo, Egypt, pp. C6 1-9, Feb. 1998.
- 25- **A. Tawfik** S. Stergiopoulos and A. C. Dhanantwari "A Generic Beamforming Structure Allowing Implementation of Adaptive Processing Schemes of 2-D & 3-D Arrays of Sensors", *Oceans 97' MTS/IEEE*, Halifax, pp. 369-373 Oct. 1997.
- 26- **A. Tawfik** and S. Stergiopoulos " A Generic processing Structue Decomposing the Beamforming Process of 2-D & 3-D Arrays into Sub-sets of Coherent Processes ", *Canadian Conf. Elec., Comp. Eng.*, Newfoundland, pp. 560-563, Sept. 1997.
- 27- **A. Tawfik**, P. Agathoklis, and F. El-Guibaly, "New Residue-Feedback State-Space

IIR Digital Filter Realizations", *IEEE Int.~Symp.~Circuits, Sys.*, Seattle, WA , pp. 61-64, May 1995.

Other Publications

1. **A. Tawfik**, "Strategy of the Research Concept According to the Vision in AUSTN", Conference of Research strategies in the Islamic Universities, Quala Lampour, Malaysia, July, 2010.
2. **A. Tawfik**, "Speech Coding Techniques for Mobile Radio Communication, Internal Report for Promotion Committee, Cairo, Egypt, 2004.
3. P. Agathoklis **and A. Tawfik**, "Roundoff Noise and Limit Cycles in Digital Filters", Digital filters, CRC Press, 1995.
4. **A. Tawfik**, P. Agathoklis, and F. El-Guibaly, Finite Word Length Effect in Fixed Point IIR Digital Filters", Technical Report VMC-93-1, ECE Dept., University Victoria, B.C., 1993.
5. F. El-Guibaly, **A. Tawfik**, W.-S. Lu, and E. Abdel-Raheem, "Synthesizing Systolic Arrays: Basic Tools", Technical Report, UVIC, Canada.

Supervised Theses

- 1- "Mohammed Noman", Indoor Envision System For The Visually Impaired" MPhil, Department of Electronic and Electrical Engineering University of Strathclyde, Glasgow, Dec. 2019.
- 2- "Ahmed Elgindy", Robust Watermarking Techniques for Digital Images", Ph.D thesis under process, Ajman University of Science & Technology with Bradford University in UK.
- 3- "M. Sadek", Speech Coder for Wireless Communications", M.Sc. 2001, Ain-Shams Univ., Egypt.
- 4- "M. Masoud" Variable Bit-Rate Speech Coder M.Sc. 2001, An-Shams Univ., Egypt.