Résumé
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EXECUTIVE SUMMARY

- ✓ *Received a PhD degree in Electrical Engineering in 2004 from the University of Houston, USA.*
- ✓ *12 years of engineering teaching and management in the Mechatronics Engineering Department, The Hashemite University, taught numerous engineering courses and supervising graduate and undergraduate students.*
- ✓ *One-year sabbatical leave in the Mechatronics Engineering Department, Philadelphia University, pursued research in Chaotic Synchronization and taught a graduate course in Advanced Sensors.*
- ✓ *10 years in US private industry, worked for Inteplast Corporation, Compaq Computer Corporation, and FMC Energy Corporation.*
- ✓ *Commissioning project engineer for subsea-oil production equipment in Gulf of Mexico and West Africa.*
- ✓ *Commissioning project engineer for Bruckner plastic-film production lines in Houston.*
- ✓ *Department chair for two years leading the department toward excellence in the teaching, research and service activities.*
- ✓ *Member for numerous academic committees in the department and college.*
- ✓ *Actively involved in research in the areas of chaotic systems, energy systems, and mechatronics systems.*
- ✓ *Thesis supervisor for two master students in Nondestructive Testing and Energy Storage Systems.*
- ✓ *Thesis supervisor for more than 110 Bachelor students in Mechatronics Engineering.*
- ✓ *27 published research papers in refereed journals and international conferences.*
- ✓ *Taught more than twenty Engineering courses for graduate and undergraduate students.*
- ✓ *Referee to numerous technical articles for many international engineering journals.*
- ✓ *Recipient of two academic scholarships for graduate and undergraduate studies.*
- ✓ *Academically descendant of Euler and Gauss (please see PhD Genealogy toward the end).*

EDUCATION

- ***PhD*** *in Electrical Engineering / Control Engineering*
  University of Houston, Houston, Texas, USA, August, 2004
  Dissertation title: Digital redesign of uncertain nonlinear control systems

- ***MSc*** *in Electrical Engineering / Control Engineering*
  University of Houston, Houston, Texas, USA, August, 1993
  Dissertation title: A general-purpose digital controller for nonlinear dynamical systems

- ***BSc*** *in Electrical Engineering*
  Jordan University of Science and Technology, Jordan, February1989

PROFESSIONAL EXPERIENCE AND SIGNIFICANT ACHIEVEMENTS

ACADEMIC EXPERIENCE:

- ***Mechatronics Engineering Department, The Hashemite University***
  Associate Professor (2012-Present)
  - ✓ *Conducting research in the areas of chaotic systems, energy systems, and mechatronics systems.*
  - ✓ *Designing and teaching new Mechatronics Engineering courses.*
  - ✓ *Supervising the practical training efforts for department students.*
  - ✓ *Supervising more than 90 bachelor theses of the final year project.*
  - ✓ *Updating Lab. manuals and experiments in the daprtment.*

- ***Sabbatical Leave, Mechatronics Engineering Department, Philadelphia University (2013/2014)***
  - ✓ *Conducted research in the areas of digital design of chaotic synchronization.*
  - ✓ *Supported Mechatronics Master Program and taught a graduate course in advanced sesnors.*

- ***Mechatronics Engineering Department, The Hashemite University***
  Assistant Professor (2004-2012)
  - ✓ *Established a new state of art Automation lab with Festo production stations and Siemens PLCs.*
  - ✓ *Developed professional logistics to monitor student performance.*
  - ✓ *Led and mentored students in graduation projects.*
  - ✓ *Evaluated and improved student academic performance.*
  - ✓ *Participated in departmental and college committees and activities.*

- ***Mechatronics Engineering Department, The Hashemite University***
  Department Chairman (2005-2007)

- ✓ *Led the curriculum development process and formulating of strategic plan.*
- ✓ *Led the department to achieve the Ministry of Higher Education first national ranking among other Mechatronics Engineering Departments in the country in the year 2006.*
- ✓ *Led and coordinating the department efforts to achieve ABET accreditation.*
- ✓ *Led Overall management of projects from conception to completion.*
- ✓ *Managed of project team functions.*
- ✓ *Supervised of a team of staff.*
- ✓ *Reviewed project programs and updated it on a regular basis.*

- ***Electrical Engineering Department, University of Houston, Houston, Texas***
  Teaching assistant (1991-1993)
  - ✓ *Instructed practical sessions and labs.*
  - ✓ *Prepared lab material and assignments.*
  - ✓ *Graded assignments and exams.*

INDUSTRIAL EXPERIENCE:

- ***FMC Energy Corporation, Houston, Texas***
  Project Engineer (2002-2003)
  Major Projects: *Designing, Testing, and Commissioning of the Topside Control System of Exxon MEGI SEA Subsea Project in West Africa. Also, Testing, and Commissioning of the Topside Control System of BP Thunder-Horse Subsea Project in Gulf of Mexico.*

- ***Compaq Computer Corporation, Houston, Texas***
  System Engineer (2000-2002)
  Major Projects: *Testing and Integration of 'Out Of Box Experience' (OOBE) System for Presario Desktops and Laptops. Developing test-procedure manuals for many Compaq Platforms.*
  Also, obtained ***the Microsoft Certified Systems Engineer (MCSE) certification****.*

- ***Inteplast Corporation, Lolita, Texas***
  Maintenance Engineer (1994-2000)
  Major Projects: *Installation, Commissioning, Troubleshooting, and Maintaining of two Siemens-PLC-based LAN-Driven Bruckner Extruder Production-Lines. Also, Installation, Testing, and Commissioning of eight Allen-Bradley-PLC-Based Bagging Production-Lines.*

CONFERENCES

***M. Ababneh**, H. Sha'ban, D. AlShalabe, D. Khader, H. Mahameed, M. AlQudimat, "Gesture Controlled Mobile Robotic Arm for Elderly and Wheelchair People Assistance Using Kinect Sensor", 15th IEEE International Multi-Conference on Systems, Signals and Devices, IEEE, Tunisia, March 2018.*

***M. Ababneh**, "A New Four-Dimensional Chaotic Attractor" ,2015 IEEE Jordan Conference On Applied Electrical Engineering And Computing Technologies. The Dea Sea: IEEE, 2015.*

***M. Ababneh,** W. Kakish, O. Mohareb, I. Etier , "Investigation of Wind Energy in Jordan", International Conference and Exhibition on Green Energy & Sustainability for Arid Regions & Mediterranean Countries (ICEGES 2009), Le Royal Hotel Amman, Jordan November, 10-12 2009.*

*I. Etier, A, AlTarabsheh, **M. Ababneh**, "Investigation of Solar Energy in the Hashemite University", International Conference and Exhibition on Green Energy & Sustainability for Arid Regions & Mediterranean Countries (ICEGES 2009), Le Royal Hotel Amman, Jordan November, 10-12 2009.*

***M. Ababneh** "Synchronization of Chaos Systems", Fifth International Symposium on Mechatronics and its Applications, Amman, Jordan, 27-29 May, 2008.*

***M. Ababneh**, A. Almanasreh, H. Amasha, "Design of digital controllers for uncertain chaotic systems using fuzzy logic", Fourth AUS-International Symposium on Mechatronics, American University of Sharjah, March 2007.*

*I. Etier, **M. Ababneh**, " Photovoltaic system as an alternative source of electricity generation: A case study in Hashemite University / Jordan", Proceedings of the Third International Conference on Thermal Engineering: Theory and Applications, Jordan, May 2007.*

***M. Ababneh**, J. Ramerez, "Design of Robust Controllers for Uncertain Piecewise Linear Systems", Third International Symposium on Mechatronics and its Applications, American University of Sharjah, AUE, April 2006.*

PUBLICATIONS

***M. Ababneh,** A Ishtay, **"**A New Hydro-Compressed Air Storage System Using Repetitive-Controlled Technique", International Review of Mechanical Engineering, Accepted February 2018.*

M. Ababneh, *A. A. Al-Jarrah, H. Sha'ban, S. BaniHani, A. M. Al-Jarrah, T. AlMomani, and Y. AlHammad, " Recovering Waste Heat from Automobile Engine Using Thermoelectric Power Generators", International Review of Mechanical Engineering (2017): Accepted Nov. 2017.*

M. Ababneh*, A Ishtay, "Modelling of a new hydro-compressed air-storage system", International Journal of Sustainable Energy, Accepted on 30 July 2017.*

M Ababneh*, "A new four-dimensional chaotic attractor", Ain Shams Engineering Journal, Accepted on 14 Feb. 2017.*

A Al-Jarrah, ***M. Ababneh****, S BaniHani, K Al-Widyan ,"Synchronization of Chaotic Systems with Uncertain Time-Varying Parameters", International Review of Mechanical Engineering (IREME) 9 (6), 568-575, 2015.*

I. Etier, ***M. Ababneh****, A. Tarabsheh, "Design and simulation of a PV-grid connected system", International Journal of Computational Science and Engineering 10 (4), 423-429, 2015.*

M Ababneh*, "Controlling of Chaos Synchronization", Jordan Journal of Mechanical & Industrial Engineering 9 (2), 2015.*

J. Ghaeb, M. Smadi, ***M. Ababneh****, "Progressive decrement PWM algorithm for minimum mean square error inverter output voltage", Energy conversion and management 52 (11), 3309-3318, 2011.*

S. Banihani, K. Al-Widyan, A. Al-Jarrah, ***M. Ababneh****, "A genetic algorithm based lookup table approach for optimal stepping sequence of open-loop stepper motor systems", Journal of Control Theory and Applications 11 (1), 35-41, 2013.*

M. Ababneh*, I. Etier, M. Smadi, J. Ghaeb, " Synchronization of chaos systems using fuzzy logic", Journal of Computer Science 7 (2), 197, 2011.*

I. Etier, ***M. Ababneh****, A. Tarabsheh, "Simulation of a 10 kW Photovoltaic system in areas with high solar irradiation", American Journal of Applied Sciences 8 (2), 177. 2011*

M. Ababneh*, A. Al-jarrah, K. Al-Widyan, S. Banihani, "Variable Structure Controller Schemes Based on Work and Energy Principle for SIMO Systems", Jordan Journal of Mechanical and Industrial Engineering, 2010.*

M. Ababneh*, M. Salah, K. Al-Widyan, " Linearization of nonlinear dynamical system: A comparative study", Jordan Journal of Mechanical and Industrial Engineering, 2010.*

__M. Ababneh__, A. Almanasreh, H.Amasha, "Design of digital controllers for uncertain chaotic systems using fuzzy logic", Journal of Franklin Institute, vol. 346, p. 543–556, Feb. 2, 2009.

__M. Ababneh__, J. Ramerez, G. Chen, L. Shieh, "Robust Digital Controllers for Uncertain Chaotic Systems: A Digital Redesign Approach", Journal of Chaos, Solitons & Fractals, Elsevier, vol 31, Issue 5, pp. 1149-1164, March 2007.

I. Etier, A. Al-Tarabsheh, __M. Ababneh__, " Analysis of solar energy in Jordan", Jordan Journal of Mechanical and Industrial Engineering, Volume 4, Number 6, Pages 733 – 738, 2010.

M. Smadi, __M. Ababneh__, S.Al-jazzar, "Simulation and Numerical Analysis of Wireless PSK Systems with Imperfect Carrier Phase Recovery", International Journal of Modeling Simulation, vol. 29, no. 4, pp. 405–409, 2009.

A. Ababneh, A. Jawarneh, H. Tlilan, __M. Ababneh__, "The Effects of the Secondary Fluid Temperature on the Energy Transfer in an Unsteady Ejector with a Radial-Flow Diffuser", Heat and Mass Transfer, vol. 46, no. 1, pp. 95–105, 2009.

M. Alia, __M. Ababneh__, K. Al-Widyan, "Custom-Design of a PID/PWM Program to Control a Heater Temperature", Journal of Institution of Mathematics & Computer Sciences, vol. 19, No. 2, pp. 121-133, 2008.

THESES SUPERVISED

Master Thesis Supervised

A Ishtay "Design and Control of low-Scale Compressed-Air Energy Storage System" , December 2016.

I. Abu-Sukhun, "Non-destructive testing using advanced techniques for modeling and detection of cracks in steel water pipes" May 2010.

Selected Bachelor Theses for final-year design-project

W. Bargoti, N. Abo-Lawi, M. Awad, K. Khataibeh & A. Omari, "Design and implementation of a smart baby cradle," May 2016.

O. Rood, S. Khwaldeh, M. Rabah, A. Namneh & A. Zyood, "Design and implementation of a PLC-controlled solar system," May 2014.

B. Talal, A. Mamon, M. Ijbarah, B. Burhan & H. Tarteer, "Design and implementation of a three-axis CNC machine," May 2010.

M. Kleif, R. Hijazeen, E. Dawood, F. Boobaly & H. Kharabsheh, "Design and implementation of a voice-activated coffee machine," May 2008.

M. Issa, M. Momani, A. Mohammad, F. Shlash & H. Naeem, "Design and implementation of an Internet-activated vehicle," May 2006.

A. Khatan, M, Samarah, R. Tmimi, A. Fretek & Y. Ashor, "Design and implementation of a solar car," May 2005.

UNDERGRADUATE & GRADUATE TEACHING COURSES

1. *Microprocessors and Microcontrollers*
2. *Control Systems (1)*
3. *Control Systems (2)*
4. *Digital Signals*
5. *Transducers and Interfacing*
6. *Automation*
7. *Ethics and Communication Skills*
8. *Microcomputer Systems*
9. *Digital Logic and Digital Electronics*
10. *Automatic Control*
11. *Engineering Skills*
12. *Special Topics in Mechatronics*
13. *Graduation Project (1)*
14. *Graduation Project (2)*
15. *Modern Control*
16. *Applied Mathematics*
17. *Electronics*
18. *Embedded systems*
19. *Technical writing*
20. *PLC automation*
21. *Advanced Engineering Analysis*
22. *Advanced Measurement Systems and Sensors*

PROFESSIONAL MEMBERSHIPS

2005 *Centre for Chaos Control and Complex Network*
1994 *Engineering Association in Jordan.*
1993 *University Houston Alumni Club.*
1988 *Jordan University of Science and Technology Alumni Club.*

FELLOWSHIPS AND AWARDS

2005	*Certificate of recognition from Izat Sarrayiji Company in Amman for Automation of one of their straw production lines using Siemens PLC.*
2003-2004	*Scholarship from the Hashemite University, during the PhD studies at University of Houston*
2003	*Certificate of Recognition for outstanding project engineering for "Exxon Megi-Sea" project from FMC Energy Systems in Houston, Texas.*
2000	*Grant from Compaq Computer Corporation, during the PhD studies at University of Houston.*
2000	*Certificate of Appreciation for preparing test-procedure manuals for Compaq Presario laptops from Compaq Computer Corporation in Houston, Texas, USA.*
2000	*Microsoft Certified Systems Engineer (MCSE) form Microsoft Company, USA.*
2000	*Microsoft Certified Professional (MCP) form Microsoft Company, USA.*
1990–1992	*TA and RA from University of Houston during Masters studies.*
1983–1988	*Scholarship from the Jordanian Government, during Bachelor study.*

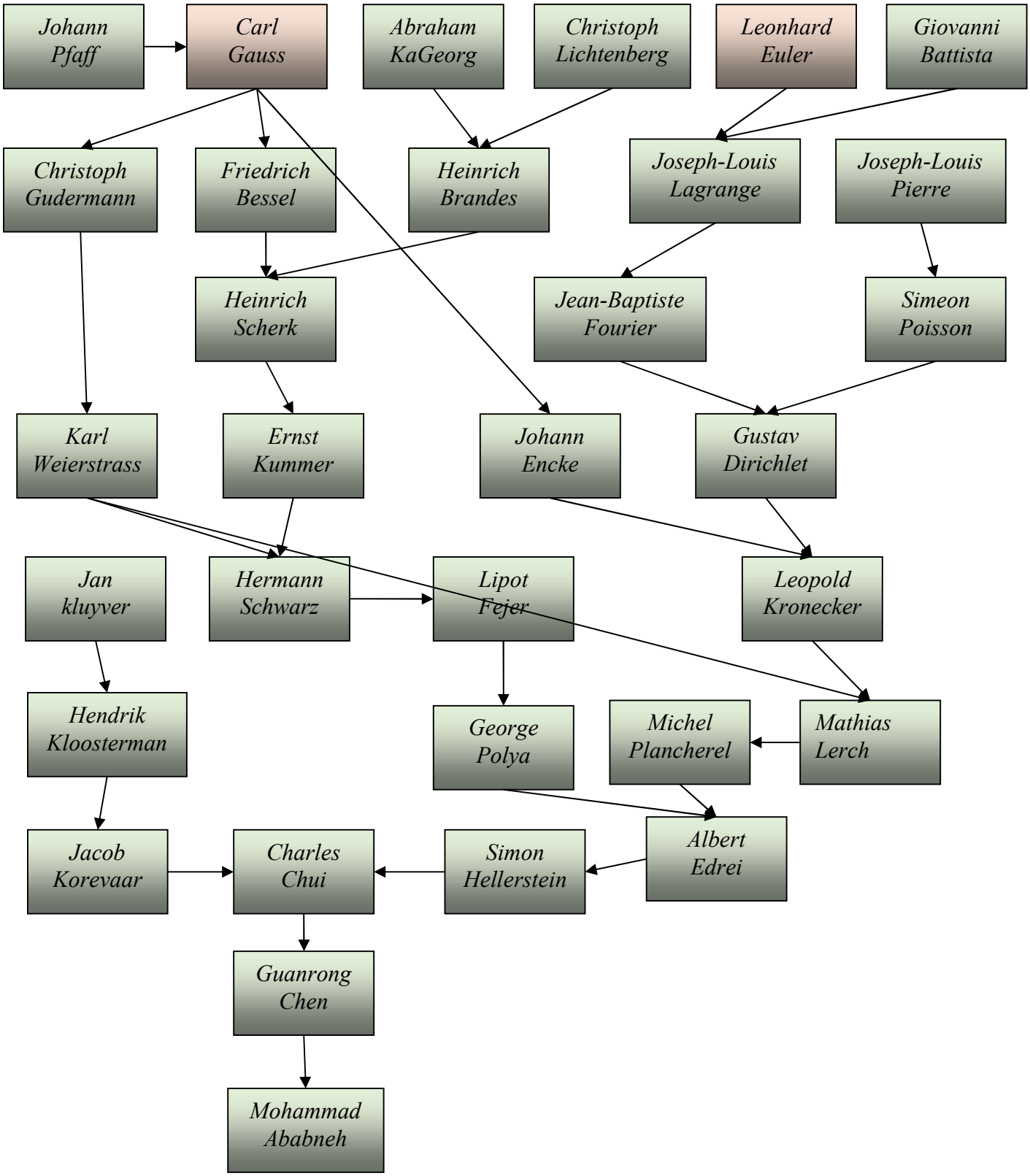
REFERENCES

- *Prof. Leang-San **Shieh**, Department of Electrical Engineering, University of Houston, Houston, Texas. USA.*
- *Prof. Guanrong **Chen**, Department of Electronic Engineering, Faculty of Engineering, City University of Hong Kong University, Hong Kong.*
- *Prof. Mohammad **Hiyassat**, Department of Civil Engineering, Faculty of Engineering, University of Jordan, Jordan.*
- *Prof. Khaled **Assaleh**, Department of Electrical Engineering, College of Engineering, American University of Sharjah, AUE.*

PERSONAL

Year of Birth: *1965* ***Marital Status****: Married*

PhD Genealogy



Research Statement

Mohammad Ababneh
The Hashemite University, Jordan

My research interest has been in nonlinear systems, renewable energy and mechatronics systems. However, my main interest has been in studying uncertain chaos systems and designing proper robust controllers for such systems to drive them to order. Controlling chaos would have excellent impact in resolving issues with energy-critical applications such as biological systems (human heart and brain), complex networking systems (Internet and complex social systems), chemical processes, electronics, and secure communication, etc… Such wide diversity of chaos system applications have been the major motivation to my interest in these systems. I think future research would uncover more and more interesting applications in our life.

In general, physical systems with external disturbances cannot be modeled precisely and this requires robust controllers to produce desirable performance and proper relative stability. In addition, practical systems have inherited delays that would deteriorate controller performance if neglected. These delays might be contributed by significant transportations in the system, delay in signal transformation from and analog to digital signals and visa versa, and possessing delay in the digital controllers. Therefore, in wide range of applications uncertainty and time-delay should be addressed correctly to come up with a good control design. Furthermore, system synchronization plays increasingly important rule in our life, it is defined when two weakly connected systems come to behave accordingly. Obvious examples of synchronized systems are transmitter/receiver in communication systems, electrical power generation, and electronic frequency-dividers.

My future research would be focused on studying uncertain synchronized chaos system with time delay. The key point in this study is to approach these synchronized systems problem from the point of view of control theory. In this way, the design of drive/response system can be worked out as the design of a controller, or more precisely as an observer design problem. Moreover, the hybrid continuous-discrete case shall be considered, where a systematic method for designing discrete-time robust observers for continuous-time uncertain synchronized chaos-system with structured uncertainties shall be investigated. This is a practical approach since physical systems mostly are continuous-time systems and observers/controllers are digital.

Moreover, the chaotic synchronized systems are modeled using "optimal linear model" representation of the nominal system around every working point of the system trajectory. This will produce a set of localized linear models. The uncertainties then are decomposed by adding proper disturbance to every localized model. Then, a continuous-time robust observer is designed to eliminate the effects of the uncertainties in the system. A robust digital observer is then obtained as the result of a digital redesign of the pre-designed continuous-time robust observer, where digital redesign technique is the process of converting a previously well-designed continuous-time controller to a discrete-time

controller suitable for digital implementation, such that the states of the continuous-time and that of the discrete-time (sampled-data) closed-loop systems can match each other, at least at each sampling instant, throughout the entire process.

In addition, the time-delay shall be estimated using "time-delay approximation" method where the time-delay is estimated from a relationship between the input and output signals formulated in with respect to the system nature. Next, I will make use of my years of industrial experience in order to explore practical applications of the above method. I am looking forward to help uncover such applications to benefit the industrial community. I hope this will be a significant contribution toward science and technology.