

Francis Palma

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[DBLP](#) | [Google Scholar](#) | [LinkedIn](#) | [LNU](#)

Research Interests

- Empirical Software Engineering
- Patterns and Antipatterns in SOAP Web service and RESTful APIs
- Source Code Analysis and Natural Language Processing
- Software Maintenance and Evolution
- Requirements Engineering
- Search-based Software Engineering
- Machine Learning

Current Position

- **Assistant Professor** (Universitetslektor)
From November 2018 to present
Linnaeus University, Sweden
Faculty of Technology
Department of Computer Science and Media Technology
<https://lnu.se/en/>

Publications Summary

- International journal articles published 6
- International journal articles (under review) 5
- International conference articles published 10
- Workshop articles published 6
- Patents published (under review) 1(1)

Education

- **Doctor of Philosophy** (Ph.D.), 2015
Computer Engineering (Software Engineering)
University of Montreal, Canada
Thesis title: Unifying Service Oriented Technologies For The Specification And Detection Of Their Antipatterns (*Awarded Best Departmental Thesis 2015*).
Final GPA: 3.94 out of 4.
- **Master of Science** (M.Sc.), 2010
Computer Science (Software Technologies)
University of Trento, Italy
Thesis title: Using Interactive Genetic Algorithm for Requirements Prioritization.
Final Score: 96 out of 110.
- **Bachelor of Science** (B.Sc.), 2005
Computer Science and Engineering
International Islamic University Chittagong (IIUC), Bangladesh
Thesis title: An Efficient Technique for Text Compression.
Final CGPA: 3.486 out of 4.

Workshops Attended

- **Educator's Workshop**: The 15th SEI Software Engineering Educators Workshop, Pittsburgh, PA, July 31 - August 2, 2018. Workshop on (1) DevOps in Practice and (2) Managing Technical Debt of Software.

Teaching / Supervising Experience

4ME307 Internet Architectures – 7.5 credits (Master's level)

Spring 2019 (March – June)

Spring 2020 (March – June)

- Overview of relevant concepts and contemporary approaches to design and implement web architectures.
- Integration approaches and techniques for bridging web and mobile applications.
- Data management approaches and techniques for developing large web applications.
- Case studies for making appropriate design decisions for scalable and robust web architectures.

1DV510 Technical Information and Communication – 7,5 credits (Bachelor level)

Fall 2019 (November – January)

- Professional spoken and written communication
- Academic writing and presentation and peer review
- Tools and standards for scientific publishing
- Library knowledge
- Visualisation

2DV603 Software Engineering – Design – 7.5 credits (Bachelor level)

Winter 2019 (January – June)

Winter 2020 (January – June)

- Requirement Engineering: Understanding and Elicitation of Software Requirements, Requirements Validation and Management, Modeling with UML, Requirements Modelling and Management with Tools

1DV527 The Web as an Application Platform – 7,5 credits (Bachelor level)

Winter 2020 (January – April)

- Web Science
- The Web as an application platform
- **Web APIs (responsible)**
- Web of Things (WoT)

1DT305 Introduction to Applied Internet of Things – 7,5 credits (open level)

Summer 2020 (July – August)

- Introduction to Internet of Things (IoT)
- Basic programming in Python and MicroPython
- Essentials of sensors and sensor data gathering
- IoT infrastructure and message protocols
- Data visualisation and database
- Building IoT projects

CKME 136 Data Analytics (Capstone Project)

Fall 2018, Students Supervised: 12

- Course Description: The Data Analytics Fast Track offers students the unique opportunity to earn a Certificate in Data Analytics, Big Data, and Predictive Analytics in an intensive, 15-week, fast-track program in the Spring/Summer term. During the Fall term, students will engage in hands-on application of analytics in a project setting. This course is intended to apply their machine learning competencies to a real-world area of interest. Working with me as a faculty supervisor, students apply what they have learned in their courses: CIND 110 Data Organization for Data Analysts, CIND 119 Introduction to Big Data, CIND 123 Data Analytics: Basic Methods, CIND 719 Big Data Analytics Tools, CMTH 642 Data Analytics: Advanced Methods.

Degree Projects at Bachelor Level (2DV50E):

- 7 theses completed during 2019-20
- 10 theses in progress

Grad/Undergrad Students Co-supervised during Post-doctoral Research in Concordia University, Canada.

- Beyza Eken, Visiting PhD Student, September 2018 to December 2018, beyzaeken@itu.edu.tr, Istanbul Technical University (ITU).
- Navid Nazarzade, MSc Student, December 2015 to November 2016, n_nazarz@encs.concordia.ca, Concordia University
- Gaëtan François, Intern, June 2016 to August 2016, gaetan.francois@etu.umontpellier.fr, Polytech Montpellier – Université de Montpellier

Grad/Undergrad Students Co-supervised during PhD Research in UQAM and UdeM, Canada.

- Mohamed Fuoni, MSc Student, January 2014 to December 2015, mohamed.founi@gmail.com, Université du Québec à Montréal
- Charlie Fauchoux, Intern from France June to August 2014, charlie.fauchoux@etu.univ-nantes.fr, Université de Nantes
- Dubois Johann, Intern from France January to May 2014, johann.dubois@viacesi.fr, l'Ecole Supérieure d'informatique Cesi
- Ons Mlouki, Intern from Tunisia (Currently MSc Student at Ecole Polytechnique) May – September 2013, ons.mlouki@gmail.com, École Nationale des Sciences de l'Informatique
- Onfroy Guillaume, Intern from France January to June 2012, guillaume.onfroy@viacesi.fr, l'Ecole Supérieure d'informatique Cesi
- Joyen Benjamin, Intern from France January to June 2012, benjamin.joyen-conseil@viacesi.fr, l'Ecole Supérieure d'informatique Cesi
- Mathieu Nayrolles, Intern from France (Currently PhD Student at Concordia University) January to June 2012, mathieu.nayrolles@viacesi.fr, l'Ecole Supérieure d'informatique Cesi

Academic Talks (slides on my site)

- **Lakehead University** (LU), Canada, a research talk on *Service Antipatterns: 'Poor' Quality of Design for Service-based Systems* and a teaching lecture on *Software Fault Tolerance and Recovery: Introduction to Software Fault Tolerance* in June 2017.
- **Thompson Rivers University** (TRU), Canada, a research talk on *Service Antipatterns 'Poor' Quality of Design for Service-based Systems* and a teaching lecture on *Principles of Software Engineering: Software Configuration Management* in June 2017.
- **Indiana Wesleyan University** (IWU), USA, a teaching lecture on *Computer Graphics and Gaming: Simulation, Graphics, Gaming, and Other Applications* in February 2017.
- **Rochester Institute of Technology** (RIT), USA, a research talk on *Service AntiPatterns: An Explanation to "Poor" Quality of Design for Service-based Systems* in December 2016.
- **University of Ontario Institute of Technology** (UOIT), Canada, a teaching lecture on *Principles of Software and Requirements Engineering: Software Configuration Management* in May 2016

Academic/ Research Awards

- OCE TalentEdge Fellowship for two years by Ontario Centres of Excellence (OCE), Canada.
- Best Ph.D. Thesis Award 2015 - from the Department of Computer and Software Engineering, Ecole Polytechnique de Montreal.
- Best Research Paper award at IEEE International Conference on Service Oriented Computing & Applications (SOCA) 2014, Matsue, Japan.
- Best Research Paper award (runner-up) at International Conference on Service Oriented Computing (ICSOC) 2012, China.
- Graduate Research Scholarship (for Ph.D. research), Polytechnique de Montreal, Canada (2011-15).
- Opera Merit Award (for early completion of the MSc) from University of Trento, Italy, 2011 (Web: unitn.it/en/incoming/21527/merit-award).
- Borse di Studio (Study Scholarships for MSc), by Opera Universitaria di Trento, Italy, 2008-2010.

Published International Conference Proceedings/

- **Published/Filed Patent(s):**
 - **Filed:** Soosan Beheshti, Assadallah Sahebalam, Edward W. Nidoy, **Francis Palma:** *Methods and Systems for Energy Use Normalization and Forecasting*, United States application number 15/444,456 (standard, filed in February 2017)

- by Screaming Power Inc)
- **Published:** Sadaf Mustafiz, **Francis Palma**, Maria Toeroe and Ferhat Khendek: A Network Service Design and Deployment Process for NFV Systems, Publication No. **US 2018/0309646 A1**, Publication Date: October 25 2018, <https://patentscope.wipo.int/search/en/detail.jsf?docId=WO2018033878>
 - **Articles under Review/Revision:**
 - Fatima Sabir, **Francis Palma**, Ghulam Rasool, Naouel Moha, Yann-Gaël Guéhéneuc, and Hassan Akhtar, *Correction of Antipatterns in RESTful APIs using the Evolution History*, International Journal of Cooperative Information Systems (IJCIS), Submitted in November 2018 (under review).
 - **Francis Palma**, Shirin Akbarinasaji, Ayse Bener, John Maidens, Stella Liu: *Preserving Bidirectional Traceability between Test and Source Artifacts: An Industrial Case Study*, under review in Software Quality Journal (SQJ).
 - **Francis Palma**, Tobias Olsson, Javier Gonzalez-Huerta, Anna Wingkvist: *Assessing the Linguistic Quality of REST APIs for Internet of Things* under revision in Journal of Software and Systems (JSS).
 - Ghulam Rasool, Yasir, Hussain, **Francis Palma**: *Design Patterns for Mobile Games Based on Structural Similarity* under revision in Frontiers of Computer Science (FCS) journal.
 - **Francis Palma**, Michel Chaudron, Arif Nurwidyantoro, Ho Quang Truong, and Yann-Gaël Guéhéneuc: *Studying the Occurrence of (Anti)Patterns through the Lens of Role-Stereotypes in Software Designs* under revision in Empirical Software Engineering (EMSE) journal.
 - Beyza Eken, **Francis Palma**, Ayse Basar, Ayse Tosun: *An Empirical Study on the Impact of Community and Code Smells on Bug Prediction* under review in Software Quality Journal (SQJ).
 - **Refereed International Journal Article(s) Published:**
 - Fatima Sabir, **Francis Palma**, Ghulam Rasool, Yann-Gaël Guéhéneuc, and Naouel Moha, *A Systematic Literature Review on the Detection of Smells and their Evolution in Object-Oriented and Service-Oriented Systems*, Journal of Software: Practice and Experience (SPE 2018), <https://doi.org/10.1002/spe.2639>.
 - Fabio Petrillo, Philippe Merle, **Francis Palma**, Naouel Moha, Yann-Gaël Guéhéneuc, *A Lexical and Semantical Analysis on REST Cloud Computing APIs*, Communications in Computer and Information Science (CCIS 2018), Springer, DOI https://doi.org/10.1007/978-3-319-94959-8_16, Online ISBN 978-3-319-94959-8, Print ISBN 978-3-319-94958-1.
 - **Francis Palma**, Naouel Moha, and Yann-Gaël Guéhéneuc, *UniDoSA: The Unified Specification and Detection of Service Antipatterns*, IEEE Transactions on Software Engineering (IEEE TSE 2018), DOI: 10.1109/TSE.2018.2819180.
 - **Francis Palma**, Javier Gonzalez-Huerta, Mohamed Founi, Naouel Moha, And Guy Tremblay, Yann-Gaël Guéhéneuc, *Semantic Analysis of RESTful APIs for the Detection of Linguistic Patterns and Antipatterns*, International Journal of Cooperative Information Systems (IJCIS, 2017) DOI: <https://doi.org/10.1142/S0218843017420011>.
 - **Francis Palma**, Mathieu Nayrolles, Naouel Moha, Yann-Gaël Guéhéneuc, Benoit Baudry, and Jean-Marc Jézéquel, *SOA Antipatterns: An Approach for their Specification and Detection*, International Journal of Cooperative Information Systems (IJCIS, 2013) DOI <https://doi.org/10.1142/S0218843013410049>.
 - Paolo Tonella, Angelo Susi, **Francis Palma**, *Using Interactive GA for Requirements Prioritization*, Information and Software Technology (IST, 2012). <http://dx.doi.org/10.1016/j.infsof.2012.07.003>
 - **Peer-Reviewed International Conference Papers Published:**
 - **Francis Palma**, Tamer Abdou, Ayse Bener, John Maidens, Stella Liu: *An Improvement to Test Case Failure Prediction in the Context of Test Case Prioritization*. 14th International Conference on Predictive Models and Data Analytics in Software Engineering (PROMISE) 2018, Oulu, Finland: 80-89.
 - Sadaf Mustafiz, **Francis Palma**, Maria Toeroe and Ferhat Khendek, *A Network Service Design and Deployment Process for NFV Systems*, Network Computing and Applications (NCA), 2016 IEEE 15th International Symposium on. IEEE, 2016, 10.1109/NCA.2016.7778607

- **Francis Palma**, Javier Gonzalez-Huerta, Naouel Moha, Guy Tremblay, and Yann-Gaël Guéhéneuc: *Are RESTful APIs Well-designed? Detection of their Linguistic (Anti)Patterns*. International Conference on Service Oriented Computing (ICSOC), Goa, India (November 2015).
- **Francis Palma**, Naouel Moha, and Yann-Gaël Guéhéneuc: *Specification and Detection of Business Process Antipatterns*. In Proceedings of the 6th International MGETECH Conference, May 12-15th, 2015, Montreal, Canada. (May 2015).
- **Francis Palma**, Le An, Foutse Khomh, Naouel Moha, and Yann-Gaël Guéhéneuc: *Investigating the Change-proneness of Service Patterns and Antipatterns*. In Proceedings of the 7th IEEE International Conference on Service Oriented Computing & Applications (SOCA, Best Paper Award), Matsue, Japan. (November 2014).
- **Francis Palma**, Johann Dubois, Naouel Moha, and Yann-Gaël Guéhéneuc: *Detection of REST Patterns and Antipatterns: A Heuristics-based Approach*. In Proceedings of the 12th International Conference on Service Oriented Computing (ICSOC), Paris, France. Springer (November 2014).
- **Francis Palma**, Naouel Moha, Guy Tremblay, and Yann-Gaël Guéhéneuc: *Specification and Detection of SOA Antipatterns in Web Services*. In Proceedings of the 8th European Conference on Software Architecture (ECSA), Vienna, Austria. Springer (August 2014).
- Naouel Moha, **Francis Palma**, Mathieu Nayrolles, Benjamin Joyen Conseil, Yann-Gaël Guéhéneuc, Benoit Baudry, and Jean-Marc Jézéquel: *Specification and Detection of SOA Antipatterns*. In Proceedings of the 10th International Conference on Service Oriented Computing (ICSOC, Best Paper Award-Runner up), Shanghai, China. Springer (November 2012).
- **Francis Palma**, Angelo Susi, Paolo Tonella: *Using an SMT Solver for Interactive Requirements Prioritization*, SIGSOFT FSE, ACM, pp. 48-58 (19th ACM SIGSOFT Symposium on the Foundations of Software Engineering), Szeged, Hungary, 2011.
- Paolo Tonella, Angelo Susi, and **Francis Palma**: *Using Interactive GA for Requirements Prioritization*, In Proceedings of Second International Symposium on Search Based Software Engineering (SSBSE), Benevento, Italy, 2010.
- **Peer-Reviewed International Workshop Papers Published:**
 - **Francis Palma** and Naouel Moha, *A Study on the Taxonomy of Service Antipatterns*, in the proceedings of 2nd on Patterns Promotion and Anti-patterns Prevention (PPAP) 2015 co-located with 22nd IEEE International Conference on Software Analysis, Evolution, and Reengineering (SANER 2015), Montréal, Canada.
 - **Francis Palma**, *Specification and Detection of SOA Antipatterns*, Ph.D. Symposium, in conjunction, with 30th International Conference on Software Maintenance and Evolution (Victoria, Canada), ICSME 2014, September 28 - October 3, Victoria, Canada 2014.
 - **Francis Palma**, Naouel Moha, and Yann-Gaël Guéhéneuc, *Detection of Process Antipatterns: A BPEL Perspective*, Workshop on Methodologies for Robustness Injection into Business Processes (MRI-BP), in conjunction with the 17th IEEE International EDOC Conference (EDOC 2013), "The Enterprise Computing Conference", 9-13 September 2013, Vancouver, Canada.
 - **Francis Palma**, *Detection of SOA Antipatterns*, 8th Ph.D. Symposium (Shanghai, China), in conjunction with ICSOC 2012, (10th International Conference on Service Oriented Computing), November 12-16, Shanghai, China, 2012.
 - Mathieu Nayrolles, **Francis Palma**, Naouel Moha and Yann-Gaël Guéhéneuc, *SODA: A Tool Support for the Detection of SOA Antipatterns*, ICSOC Demonstration Track (Shanghai, China), in conjunction with ICSOC 2012, (10th International Conference on Service Oriented Computing), November 12-16, Shanghai, China, 2012.
 - **Francis Palma**, Hadi Farzin, Yann-Gaël Guéhéneuc, Naouel Moha, *Recommendation System for Design Patterns in Software Development: An DPR Overview*, Third International Workshop on Recommendation Systems for Software Engineering. In conjunction with ICSE 2012 in Zurich, Switzerland.

Technical Reports/ Theses

- **Technical Report(s):**
 - Paolo Tonella, Angelo Susi, **Francis Palma**: *Interactive Requirements Prioritization using an IGA: Complete Results* (October 2011).
 - **Francis Palma**, Angelo Susi, and Paolo Tonella: *Using an SMT Solver for Interactive Requirements Prioritization* (March 2011).
 - **Francis Palma** and Naouel Moha and Yann-Gaël Guéhéneuc, *UniDoSA: The Unified Specification and Detection of Service Antipatterns* (January 2018).
- **White Paper(s):**
 - **Francis Palma**, *Weather Normalization Case Study Comparing ENERGYSTAR's Portfolio Manager® & Screaming Power Machine Learning*, Source: <http://www.screamingpower.ca/utility-monitoring-software-system/> in August 2017.
 - **Francis Palma**, Gary Michor, Greg Doucette, *On the Comparison of Greenhouse Gas (GHG) Emissions Estimation Standards – Case Study*, Screaming Power Inc., Picton, Ontario, Canada, Source: <http://www.screamingpower.ca/greenhouse-gas-emissions-standards-case-study/> in November 2017.
 - **Francis Palma**: *Scream OpenData - A Permanent Home for Energy Big Data* (March 2017) Source: <http://www.screamingpower.ca/wp-content/uploads/2017/04/Scream-OpenData.pdf>.
- **Ph.D. Thesis:**
 - Francis Palma, *Unifying Service Oriented Technologies for the Specification and Detection of their Antipatterns*, École Polytechnique de Montréal, August 2015.
 - Awarded **Best Thesis 2015** from the Department of Computer Engineering and Software Engineering.
- **Master Thesis:**
 - Francis Palma, *Using Interactive Genetic Algorithm for Requirements Prioritization*, University of Trento, December 2010. The academic year 2009-2010.
 - Published as a research paper in SSBSE (Symposium on Search-based Software Engineering) 2010, Benevento, Italy.
- **Bachelor Thesis:**
 - Abul Kalam Azad, Shabbir Ahmed, Francis Palma, “*An Efficient Method for Text Compression*”, International Islamic University Chittagong, December 2005. Academic year 2001-2005.

Reviewing Profile

- Information and Software Technology (IST) 2020
- Software Quality Journal (SQJ) 2019
- PLOS One (PONE) 2019
- International Conference on Service-Oriented Computing (ICSOC) 2019
- Special Issue on Software Engineering in Practice (SEIP): Software: Practice and Experience (SPE) 2019
- ICSE (International Conference on Software Engineering) 2018
- IEEE TSE (IEEE Transactions on Software Engineering) 2018.
- JSS (Journal of Systems and Software) 2018.
- SOCO (Springer Soft Computing) 2018.
- IJCIS (International Journal of Computational Intelligence Systems) 2016.
- SCAM (IEEE International Working Conference on Source Code Analysis and Manipulation) 2015.
- ICSME-ERA (IEEE International Conference on Software Maintenance and Evolution, Early Research Achievements) 2015.
- SIMPAT (Elsevier Journal for Simulation Modelling Practice and Theory) 2014.
- SANER-ERA (IEEE International Conference on Software Analysis, Evolution, and Reengineering) 2014.
- MCETECH (International MCETECH Conference on e-Technologies) 2014.
- IJBPM (International Journal of Business Process Integration and Management) 2014.
- PPAP (Patterns Promotion and Anti-patterns Prevention) 2013.
- CSMR-WCRE (IEEE Conference on Software Maintenance, Reengineering and Reverse Engineering) 2013.
- IEEE TSE (IEEE Transactions on Software Engineering) 2012.
- SoSyM (Journal on Software & System Modelling) 2012.
- AUSE (Automated Software Engineering) 2012.

Professional
and Academic
Experiences

- **Assistant Professor** (Universitetslektor)
November 2018 to present
Linnaeus University, Sweden
Faculty of Technology
Department of Computer Science and Media Technology
Key research interests: Machine Learning, Internet of Things (IoT) Software Engineering (Software Quality), Requirements Engineering.
- **Capstone Project Supervisor**
September 2018 to December 2018
G. Raymond Chang School of Continuing Education
Ryerson University, Canada
- **Postdoctoral Research Fellow**
March 2018 - October 2018
Ryerson University
Department of Mechanical and Industrial Engineering
Data Science Laboratory - DSL, www.ryerson.ca/dsl/
Key research interests: Machine Learning, Data Analytics, and Software Quality.
- **Research Scientist**
December 2016 - September 2017
Screaming Power Inc
Through OCE TalentEdge Fellowship
In collaboration with Ryerson University, Ontario, Canada
Key research interests: Data Analytics, Energy Data, Weather Normalization, Greenhouse Gas Emission, Machine Learning
- **Research Intern**
January 2016 - November 2016
Ericsson Canada Inc., Montreal, Canada.
- **Postdoctoral Research Fellow**
December 2015 - November 2016
MAGIC Group
Department of Electrical and Computer Engineering
Concordia University
Key research interests: Model-based Software Management, Network Functions Virtualization (NFV), Network Services Design, Testing of Software-as-a-Service systems
- **Research Project Collaborator**
February 2011 - July 2011
Fondazione Bruno Kessler (FBK), Trento, Italy
Key Responsibilities:
 - Proposed and implemented an innovative interactive genetic algorithm in JAVA for requirements prioritization in a software development project; Performed Unit Test using JUNIT
 - Developed a fully functional GUI tool for requirements prioritization using JAVA SWING API
 - Conducted research (academic) and empirical studies through experimentations
 - Produced technical articles and reports for publication in international conferences and journalsKey Achievements:
 - Thorough knowledge of Search Based Software Engineering and Requirements Prioritization techniques including IGA (our proposed), IAHP and NSGA-II.
- **Database Analyst and MIS Specialist**
August 2006 - August 2008
Standard Chartered Bank, (SCB), Dhaka, Bangladesh

Key Responsibilities

- Performed data-mining in the central database of SCB Bangladesh to verify data integrity, correctness, and optimization using MS Access
- Analyzed the central database of SCB Bangladesh for creating the Loan Classification Report to be submitted quarterly to the Bangladesh Central Bank
- Tracked daily, monthly, and yearly disbursement reports to evaluate the efficiency of the disbursement process
- Developed and maintained department's disbursement lodgment system in MS Access
- Created business sales MIS reports and sales summary in MS Access and Excel to highlight the business growth on the daily and monthly basis
- Performed performance and user acceptance testing for SCB's transaction systems including the ebbs, lending, and mortgage
- Handled customer complaints related to loan disbursement, loan-repayment, and account-related charges
- Provided 'Business As Usual' operational support for the processing & closure of clients' loan applications

- **Software Developer Intern**

May 2009 - October 2009

PerVoice SpA, Trento, Italy

Key Responsibilities:

- Developed software modules according to the specifications in Visual Basic and C# for video speech to text transformation from SMIL to XML, and vice versa
- Participated in system testing and user acceptance testing for software systems in Visual Basic
- Wrote installer for Visual Basic programs using NSIS (Nullsoft Scriptable Install System) scripts
- Produced documentation and user manuals for software modules and artifacts

Key Achievements:

- Knowledge of Speech to Text translation technologies
- Hands on experience on NSIS, SMIL, and SAMI technologies
- Knowledge of system and user acceptance testing

Technical Profile

- Languages: Java, Python, C/C++/C#, Visual Basic .Net
- Web Technologies: PHP, HTML/CSS, JavaScript, SOAP Web services, RESTful services
- Modelling Languages: BPMN, BPEL4WS, and UML, ADONIS, Si*, Visual Paradigm
- Tools/Applications: MS Office, Inkscape, Photoshop, R, Graphviz, LaTeX, Git/SVN, Eclipse/Net Beans
- Operating Systems: Mac OS-X, Linux, MS Windows
- Networking Concepts: TCP/IP, FTP, DNS Server, DHCP, OSI Protocol, IPv4/IPv6
- Database: MySQL Server, MS Access, FoxPro

Professional Memberships

- Member, Association for Computing Machinery (ACM Membership)
- Member, Institute of Electrical and Electronics Engineers (IEEE Membership)