

# Curriculum Vitae

**Francis PALMA**

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

**Research Interests**

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

**Current position**      **Postdoctoral Research Fellow**  
Ryerson University  
Department of Mechanical and Industrial Engineering  
Data Science Laboratory - DSL, <https://www.ryerson.ca/dsl/>

## Education

**Doctor of Philosophy (Ph.D.), 2015**  
**Computer Engineering (Software Engineering)**  
University of Montreal, Canada

**Master of Science (MSc), 2010**  
Computer Science (Software Technologies)  
University of Trento, Italy

**Bachelor of Science (BSc), 2005**  
Computer Science & Engineering (CSE)  
International Islamic University Chittagong (IIUC), Bangladesh.

## 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.

## Academic Talks

(Slides on <http://francis-palma.net/materials/>)

- **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.
- **Linnaeus University (LNU), Sweden**, a research talk on *Service Antipatterns: 'Poor' Quality of Design for Service-based Systems* in May 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](http://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/Journal Articles

#### Filed Standard/Provisionary Patent(s):

- 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)
- Sadaf Mustafiz, **Francis Palma**, Maria Toeroe and Ferhat Khendek, *A Network Service Design and Deployment Process for NFV Systems*, 2016. (standard, filed in August 2017 by Ericsson Canada)

#### Articles under Review/Revision:

- Fatima Sabir, **Francis Palma**, Ghulam Rasool, Naouel Moha, Yann-Gaël Guéhéneuc, and Hassan Akhatar, *Correction of Antipatterns in RESTful APIs using the Evolution History*, Software Quality Journal (SQJ), Springer, Submitted in August 2018 (under review).
- **Francis Palma**, Tamer Abdou, John Maidens, Ayse Bener, Stella Liu: *Predicting the Defect-proneness of Source Code for Prioritizing Test Cases*, Submitted in ESEM 2018 conference.

#### 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](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: *A Replication Study on Test Case Failure Prediction in the Context of Test Case Prioritization*, International Conference on Predictive Models and Data Analytics in Software Engineering (PROMISE) 2018, Oulu, Finland.
- 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 MCETECH 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.

## Work Experience

March 2018 - present

### **Postdoctoral Research Fellow**

Ryerson University  
Department of Mechanical and Industrial Engineering  
Data Science Laboratory - DSL, [www.ryerson.ca/dsl/](http://www.ryerson.ca/dsl/)

December 2016 - September 2017

### **Research Scientist**

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

January 2016 - November 2016

### **Research Intern**

Ericsson Canada Inc., Montreal, Canada

December 2015 - November 2016

Department of Electrical and Computer Engineering (ECE)

### **Postdoctoral Research Fellow**

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

February 2011 - July 2011  
(6 months)

Fondazione Bruno Kessler (FBK), Trento, Italy

### **Research Project Collaborator**

#### 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 journals

#### Key Achievements

- Thorough knowledge of *Search Based Software Engineering* and *Requirements Prioritization* techniques including IGA (our proposed), IAHP and NSGA-II

August 2006 - August 2008  
(2 years and 1 month)

Standard Chartered Bank, (SCB), Dhaka, Bangladesh

### **Database Analyst and MIS Specialist**

#### 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

May 2009 - October 2009  
(6 months)

PerVoice SpA, Trento, Italy  
**Software Developer Intern**

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

**Technical Report(s):**

- Paolo Tonella, Angelo Susi, **Francis Palma**: *Interactive Requirements Prioritization using a GA: 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.

### Master Thesis:

- **Francis Palma**, *Using Interactive Genetic Algorithm for Requirements Prioritization*, University of Trento, December 2010. The academic year 2009-2010

### Bachelor Thesis:

- Abul Kalam Azad, Shabbir Ahmed, **Francis Palma**, “*An Efficient Method for Text Compression*”, International Islamic University Chittagong, December 2005. The academic year 2001-2005

### Professional Memberships

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

### Organisational Skills

- Worked as
  - *Sports Team Assistant* as voluntary in Summer Camp from 01.08.2009 to 20.08.2009
  - *Creative Team Assistant* as voluntary in Summer Camp from 01.08.2010 to 20.08.2010
  - *Creative Team Assistant* as voluntary in Summer Camp from 01.08.2011 to 19.08.2011

Organized by: SOS Kinderdorf International, Innsbruck, Austria

Held at: Caldonazzo International Summer Holiday Camp, Trento, Italy

Participants: ~1200 kids from different EU SOS Villages of SOS Kinderdorf International

### Students Co-Supervised

- Navid Nazarzade  
MSc Student, December 2015 to November 2016, n\_nazarz@encs.concordia.ca, Concordia University
- Gaëtan François  
Intern, June to August 2016, gaetan.francois@etu.umontpellier.fr, Université de Montpellier
- Mohamed Fuoni  
MSc Student, January 2014 to present, mohamed.founi@gmail.com, UQAM
- Charlie Fauchoux  
Intern, June to August 2014, charlie.fauchoux@etu.univ-nantes.fr, Université de Nantes
- Dubois Johann  
Intern, January to May 2014, johann.dubois@viacesi.fr, l'Ecole Supérieure d'informatique Cesi
- Ons Mlouki  
Intern, Currently MSc Student at Ecole Polytechnique, May – September 2013, ons.mlouki@gmail.com, École Nationale des Sciences de l'Informatique
- Onfroy Guillaume  
Intern, January to June 2012, guillaume.onfroy@viacesi.fr, l'Ecole Supérieure d'informatique
- Joyen Benjamin  
Intern, January to June 2012, benjamin.joyen-conseil@viacesi.fr, l'Ecole Supérieure d'informatique
- Mathieu Nayrolles  
Intern, Currently PhD Student at Concordia University, January to June 2012, mathieu.nayrolles@viacesi.fr, l'Ecole Supérieure d'informatique