Duc M. **Le**

System Security Engineer · Software Architecture Researcher · Software Repository Miner

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Summary

Blends research experience in Software Engineering, Data Mining, and System Security with diverse and practical trainings in the software industries of Vietnam, S.Korea and U.S. to offer solid skills in software design and development. Experiences include (1) mining software repositories/big data, (2) system security, (3) architecture design, recovery, and analysis, (4) software product line engineering.

Education

University of Southern California (USC)

Los Angeles, U.S.

PhD in Computer Science, Software Architecture Research Group (SoftArch) — *Aug. 2013 - July. 2018*

- Advisor: *Prof. Nenad Medvidović* — GPA : 3.87/4.00

Pohang University of Science and Technology (POSTECH)

Pohang, S.Korea

MSc in Information Technology Convergence Engineering, Software Engineering Lab (SELab) — *Aug. 2010 - May. 2012*

- Advisor: *Prof. Kyo Chul Kang* — GPA : 95.9/100.0

Hanoi University of Science and Technology (HUST)

Hanoi, Vietnam

BSc in Information Technology (Magna Cum Laude) — *Aug. 2005 - May. 2010*

- Advisors: *Assoc. Prof. Huynh Quyet Thang (HUST), Dr. Martin Nordio (ETH Zurich)* — GPA: 8.07/10.00

Work Experience

Bloomberg L.P.

New York, U.S. & London, U.K.

Software Engineer — *July. 2018 - PRESENT*

- A member of the System Security team at Bloomberg
- Maintain and extend Bloomberg Single Sign On system.
- Manage the access control of Bloomberg's computer system

NEC Laboratories America, Inc.

Princeton, New Jersey, U.S.

Research Intern - Computer Security Group — *May. 2017 - Aug. 2017*

- Analyzed activity logs of PCs in the company's internal networks and extract patterns of safe activities.
- Built different prediction models for those patterns.
- Implemented the approach and integrated into Automated Security Intelligence (ASI) system of NEC.

Veritas Technologies LLC

Culver, California, U.S.

Software Engineering Intern - EV.Cloud Project, Platform Team — *May. 2016 - Aug. 2016*

- Applied topic modeling and machine learning techniques to intelligently suggest retention policies for customers' emails.
- Implemented and verified the proposed approach on Enron dataset using Spark, Hadoop, Cassandra, and Spring Framework.
- Was selected to present at VERITAS Cutting Edge 2016.

Samsung Research America

Irvine, California, U.S.

Research Intern - Advanced Printing Software Lab — *Jun. 2015 - Sep. 2015*

- Completed the end-to-end scenario of extracting UP (Unified Interfaces of Samsung Printers) variability information from an actual MFP (Multi-Functions Printers), representing this in a UP variability model, editing this information, and using it to configure a running simulator instance.
- This involved design and implementation using different technologies: OSGi, EMF, Eclipse plug-ins, REST-ful webservices, UI development.

Dasan Handysoft

Seoul, S.Korea

Software Engineer — *Sep. 2012 - Jun. 2013*

- Designed the server architecture of HandyUC 5.0, a platform providing various types of communication to enterprises, including email, instant messaging, and video conferencing.
- Implemented communication protocols of HandyUC, including XMPP protocol, Handysoft's legacy protocol, and a Http-based protocol.

HDC Media Vietnam

Hanoi, Vietnam

PHP developer & Asterisk PBX administrator — *Aug. 2009 - Jun. 2010*

- Developed a movie website based on Joomla platform to provide video contents to customers.
- Maintained and adapted Asterisk PBX system of the company to meet the company's requirements.

Publications

Architectural Archipelagos: Technical Debt in Long-Lived Software Research Platforms — *Mandrid, Spain*

Marcelo Schmitt Laser, **Duc M. Le**, Joshua Garcia, Nenad Medvidovic — *May. 2021*

- Proceeding of the International Conference on Technical Debt (TechDebt 2021)

Architectural Decay as Predictor of Issue-and Change-Proneness — *Stuttgart, Germany*

Duc M. Le, Suhrid Karthik, Marcelo Schmitt Laser, Nenad Medvidovic — *March. 2021*

- Proceeding of the IEEE International Conference on Software Architecture (ICSA 2021)

Arcade: an extensible workbench for architecture recovery, change, and decay evaluation — *Sacramento, U.S.*

Marcelo Schmitt Laser, **Duc M. Le**, Joshua Garcia, Nenad Medvidovic — *Nov. 2020*

- Proceeding of the ACM Joint Meeting on European Software Engineering Conference and Symposium on the Foundations of Software Engineering (ESEC/FSE 2021)

An Empirical Study of Architectural Decay in Open-Source Software Systems — *Seattle, U.S.*

Duc M. Le, Daniel Link, Arman Shahbazian, Nenad Medvidovic — *May. 2018*

- Proceeding of the IEEE International Conference on Software Architecture (ICSA 2018)

Recovering architectural design decisions — *Seattle, U.S.*

Arman Shahbazian, Youn Kyu Lee, **Duc M. Le**, Yuri Brun, Nenad Medvidovic — *May. 2018*

- Proceeding of the IEEE International Conference on Software Architecture (ICSA 2018)

A Large-Scale Study of Architectural Evolution in Open-Source Software Systems — *U.S.*

Pooyan Behnamghader*, **Duc M. Le***, Joshua Garcia, Daniel Link, Arman Shahbazian, Nenad Medvidovic — *Jun. 2017*

- Empirical Software Engineering (EMSE) Journal

Toward a Classification Framework for Software Architectural Smells — *U.S.*

Duc M. Le, Daniel Link, Yixue Zhao, Arman Shahbazian, Chris Mattmann, Nenad Medvidovic — *Feb. 2017*

- Technical Report at USC Center for Systems and Software Engineering

Architectural-Based Speculative Analysis to Predict Bugs in a Software System — *Austin, U.S.*

Duc M. Le, Nenad Medvidovic — *May. 2016*

- Proceeding of the 38th International Conference on Software Engineering (ICSE), Doctoral Symposium track

Relating Architectural Decay and Sustainability of Software Systems — *Venice, Italy*

Duc M. Le, Carlos Carrillo, Rafael Capilla, Nenad Medvidovic — *Apr. 2016*

- Proceeding of the 13th Working IEEE/IFIP Conference on Software Architecture (WICSA)

An Empirical Study of Architectural Change in Open-Source Software Systems — *Florence, Italy*

Duc M. Le, Pooyan Behnamghader, Joshua Garcia, Daniel Link, Arman Shahbazian, Nenad Medvidovic — *May. 2015*

- Proceeding of the 12th Working Conference on Mining Software Repositories (MSR)

Validating consistency between feature model and its implementation — *Pisa, Italy*

Duc M. Le, Lee Hyesun, Kyo C. Kang, Keun Lee — *Jun. 2013*

- Proceeding of the 13th International Conference on Software Reuse (ICSR)

Patents

Method for creating a feature model from legacy system source code — *Korea*

Kyo Chul Kang, Hyesun Lee, **Duc M. Le** — *July. 2013*

- Patent number: KR101290847B1
- Patent link: https://patents.google.com/patent/KR101290847B1/ko

Research Experience

Architectural Change and Decay in Open-source Software Systems — *Los Angeles, CA, U.S.*

Software Architectural Research Group, USC — *Feb. 2014 - July. 2018*

- Reversed architectures of over 800 versions of 23 open-source systems, totaling over 120 MLOCs.
- Found evolution trends related to architectural changes in software systems, rate of architectural decay occurrences, correlations among implementation decisions and architectural changes.
- Use implicit problems, e.g., architectural- and code-smells, in combination with explicit problems, e.g. reported issues and bugs, to provide an accurate, systematic and in depth approach to predict potential system problems, particularly bugs.
- Cooperated with Huawei USA in a study of how to adapt the company's codebase to architectural changes in new Android versions.

Privacy Preserving in Distributed Computation

Los Angeles, CA, U.S.

Software Architectural Research Group, USC — *May. 2014 - Aug. 2014*

- Studied sTile, a tile-based architecture, which tackles the problem of distributing computation onto cloud, while providing probabilistic guarantees that agents compromising parts of the cloud wouldn't be able to learn the private data and the nature of the computation.
- Deployed and evaluated a prototype of sTile on several main cloud services (Azure, EC2, Google Cloud).

Impact Analysis of Software Requirement Change based on Feature Relationships

Pohang, S.Korea

Software Engineering Lab, POSTECH — *Sep. 2012 - Feb. 2013*

- Reversed feature models based on variation points and variants embedded by C preprocessor.
- Verified consistency between designed models and reversed models and provided refactoring advice.
- Integrated into VULCAL Workbench, a CASE tool that supports software product line engineering.

CloudStudio - Enabling distributed projects to produce software "on the cloud"

Hanoi, Vietnam

ETH Zurich & HUST — *Aug. 2009 - Jun. 2010*

- Created the initial version of CloudStudio, an Integrated Development Environment (IDE) enabling globally distributed software projects and producing software "on the cloud".
- Developed the following features: project management, code editor, project compilation, group communication.

Honors & Awards

2018	**Best Paper Award,** ICSA 2018	*Seattle, WA, USA*
2016	**'Thesis in Three' - Best Presentation Award,** Doctoral Symposium, ICSE 2016	*Austin, TX, USA*
2015	**Awardee,** ACM SigSoft CAPS Travel Support for attending ICSE 2015	*Florence, Italy*
2014	**Awardee,** USC Doctoral Student Summer Institute Award	*Los Angeles, CA, U.S.*
2013	**Awardee,** Vietnam Education Foundation Fellowship	*U.S.*
2011	**Best Poster Prize,** 3rd International Symposium on IT Convergence Engineering	*Pohang, S.Korea*
2010	**Awardee,** Certificate of Merit for Excellent Graduation Achievement	*Hanoi, Vietnam*

Skills

Programming	Java (Proficient), Python, Linux Shell, PHP, JavaScript, C/C++
Frameworks	SAML, OAuth2, Open ID, Spark, Spring, OSGi, EMF, GWT, Joomla, Liferay, Microsoft Azure
Databases	MySQL, MongoDB
Others	Agile Development, CI/CD, LaTeX, SVN, Git, Asterisk PBX

Relevant Coursework

Software Engineering	Advanced Algorithms	Machine Learning	Database Systems
Software Architecture	Artificial Intelligence	Natural Language Processing	Information and Data Modeling
Software Testing	Decision Support Systems	Advanced Operating Systems	Information Security