

# Duc M. Le

SOFTWARE ENGINEER · SOFTWARE ARCHITECTURE RESEARCHER · SOFTWARE REPOSITORY MINER

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## Summary

Blends research experience in Software Engineering and Data Mining 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) developing cloud-based applications and web services, (3) architecture design, recovery, and analysis, (4) software product line engineering.

## Education

### University of Southern California (USC)

PHD IN COMPUTER SCIENCE, SOFTWARE ARCHITECTURE RESEARCH GROUP (SOFTARCH)

• Advisor: Prof. Nenad Medvidović

GPA : 3.87/4.00

Los Angeles, U.S.

(Expected) May 2018

### Pohang University of Science and Technology (POSTECH)

MSC IN INFORMATION TECHNOLOGY CONVERGENCE ENGINEERING, SOFTWARE ENGINEERING LAB (SELAB)

• Advisor: Prof. Kyo Chul Kang

GPA : 95.9/100.0

Pohang, S.Korea

May 2012

### Hanoi University of Science and Technology (HUST)

BSC IN INFORMATION TECHNOLOGY (MAGNA CUM LAUDE)

• Advisors: Assoc. Prof. Huynh Quyet Thang (HUST), Dr. Martin Nordio (ETH Zurich)

GPA: 8.07/10.00

Hanoi, Vietnam

May 2010

## Work Experience

### NEC Laboratories America, Inc.

RESEARCH INTERN - COMPUTER SECURITY GROUP

- 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.

Princeton, New Jersey, U.S.

May. 2017 - Aug. 2017

### Veritas Technologies LLC

SOFTWARE ENGINEERING INTERN - EV.CLOUD PROJECT, PLATFORM TEAM

- 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.

Culver, California, U.S.

May. 2016 - Aug. 2016

### Samsung Research America

RESEARCH INTERN - ADVANCED PRINTING SOFTWARE LAB

- 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.

Irvine, California, U.S.

Jun. 2015 - Sep. 2015

### Dasan Handysoft

SOFTWARE ENGINEER

- 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.

Seoul, S.Korea

Sep. 2012 - Jun. 2013

### HDC Media Vietnam

PHP DEVELOPER & ASTERISK PBX ADMINISTRATOR

- 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.

Hanoi, Vietnam

Aug. 2009 - Jun. 2010

## Skills

**Programming** Java (Proficient), Python, Linux Shell, HTML, PHP, JavaScript, C/C++

**Frameworks** Spark, Hadoop, Spring, OSGi, EMF, GWT, jQuery, Joomla, Liferay, Microsoft Azure, Amazon EC2

**Databases** MySQL, MongoDB, Cassandra

**Others** Agile Development, iPython, LaTeX, SVN, Git, Asterisk PBX

## Research Experience

### Architectural Change and Decay in Open-source Software Systems

Los Angeles, CA, U.S.

SOFTWARE ARCHITECTURAL RESEARCH GROUP, USC

Feb. 2014 - PRESENT

- 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.

## Publications

### 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

Nov. 2016

- Empirical Software Engineering (EMSE) Journal

### Architectural-Based Speculative Analysis to Predict Bugs in a Software System

Austin, U.S.

**Duc M. Le**

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)

## Relevant Coursework

Software Engineering  
Software Architecture  
Software Testing

Advanced Algorithms  
Artificial Intelligence  
Machine Learning

Advanced Operating Systems  
Database Systems  
Decision Support Systems

Information and Data Modelling  
Information Security  
Data Structures

## Honors & Awards

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**, Research Scholarship from National Research Foundation of Korea

Pohang, S. Korea

2010 **Awardee**, Certificate of Merit for Excellent Graduation Achievement

Hanoi, Vietnam