



**University
of Victoria**

Graduate Studies

Notice of the Final Oral Examination
for the Degree of Master of Science

of

FENG QIU

PhD (Southeast University, China, 2015)

“A Recommendation System for Web API Services”

Department of Computer Science

Friday, December 14, 2018

1:00 P.M.

Engineering and Computer Science Building
Room 467

Supervisory Committee:

Dr. Kui Wu, Department of Computer Science, University of Victoria (Supervisor)
Dr. Baljeet Malhotra, Department of Computer Science, UVic (Member)

External Examiner:

Dr. Issa Traoré, Department of Electrical and Computer Engineering, UVic

Chair of Oral Examination:

Dr. Kin Fun Li, Department of Electrical and Computer Engineering, UVic

Dr. David Capson, Dean, Faculty of Graduate Studies

Abstract

Web-based Application Programming Interface (API) has become an important tool for modern software development. Many enterprises have developed various types of web APIs to support their business services, such as Google Map APIs, Twitter APIs, and eBay APIs. Due to the huge number of web APIs available in public domain, unfortunately, choosing relevant and low-risk web APIs has become an important problem for developers. This research is aimed at enhancing the recommendation engine for web APIs from several aspects. First, a new scanning technique is developed to detect the usage of web APIs in source codes. Using our scanning technique, we scanned over 1.7 million Open Source projects to capture the API usage patterns. Second, we integrated three machine learning models to predict compliance risks from web APIs based on their terms of services or other legal documents. Third, utilizing the knowledge learned from scanning results and compliance risks, we built a new recommendation engine for web APIs. We conducted an experimental study to evaluate our Web API recommendation engine and demonstrate its effectiveness. Some other modules, such as finding similar web APIs and searching function-related web APIs, have also been discussed.