THANH HAI NGUYEN

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PERSONAL STATEMENT

I have PhD degree in the Computer Science Department at New Mexico State University. During my degree, I have been working as a software engineer for LandPKS project and Phylotastic since 2014, in which I applied Machine Learning and Artificial Intelligence methodologies.

I am extremely knowledgeable with eleven years of industry experience in software development. I possess a wide skill-set including both back-end and front-end development.

I am looking for a job in Machine Learning and Artificial Intelligence in an industrial company where I can contribute and grow my knowledge and experiences to the business as well as further develop my research interest in these fields.

WORKING EXPERIENCES

- **June 2021 – now: Elemental Cognition, New York, USA**

- **2014 – May 2021: New Mexico State University (NMSU), USA**

1) Senior Software Architect/Engineer – LandPKS project – a project funded by United States Department of Agriculture (http://landpotential.org) and cooperating with the Agriculture department of NMSU. GitHub: https://github.com/LandPotential

Achievements:

- Develop Data Analytic System and Prediction Model, which are based on Machine Learning techniques to get as much knowledge as possible from soil, weather, climate, and water data to build models for analyzing soil potential. (Language: C, Python, Fortran, R)

- Develop Data Portal that analyses and displays data. Link: https://portal.landpotential.org. (Language: JavaScript)

- Develop Mobile applications that allow users to collect and interact with data and view the visualization prediction data in Android and iOS.

- Develop Big-Data processing module (Hadoop) to create accessible climate data and soil profiles for all locations in the world. (Language: JAVA)

- Develop LandPKS API – a back-end API system allows clients (web portal, mobile apps, etc.) connecting and accessing to LandPKS core-data. (Language: Python)

2) Senior Software Engineer: Phylotastic project – a project funded by NSF (link: http://phylotastic.org/). GitHub: https://github.com/phylotastic.

Achievements:

- Develop Mobile Application Phylotastic that allows generating phylogenetic tree based on Phylotastic web services in Android and iOS. (Language: Swift and Java)

- Work to develop and extend Phylotastic web services.(Language: Python)

- Implement the Semantic Integration and an Automatic Web Service Composition framework (Semantics Web) – that are based on Artificial Intelligence Planning research and Machine Learning

algorithms to create, manipulate and evolve Phylogenetic Biology Workflows. (Language: C, JAVA, Python, Answer Set Programming (ASP))

- Develop Phylotastic Portal: http://phylotastic.net (Framework: Ruby on Rails)

○ **2014 – 2015: Electrical Engineering department – New Mexico State University, USA**
Freelance developer for Robotic project

Achievement: design and develop navigation and object detection features for Robot. (Language: C, JAVA)

○ **2011 – 2013: VIVAS Ltd Co., –** a member of **Vietnam Post & Telecommunication Group (VNPT), Hanoi, Vietnam**
Senior Software Architect/Engineer and Deputy Director of Research & Development department

Achievements:

- Design and develop Multiple-Screens Video Streaming Platform.

- Develop Streaming Videos Mobile Application for both Android, iOS and Web

- Design and Develop CDN (Content Delivery Network) & CMS (Content Management System) systems.

- Consult and lead the software architecture for various products in the company.

- Manage Research and Development department in technical area.

- Research to apply new technologies for current projects.

○ **2008- 2009: FPT Company, Hanoi, Vietnam –** Senior Java Developer

Achievements: develop and deploy systems for the following projects:

- WTCS_TT project: a system enabling banks to directly collect tax from taxpayers

- PIT project: a system to manage and collect personal income tax of Vietnam Tax department

EDUCATION

○ **Aug 2013- Summer 2021**: Ph.D. candidate in Computer Science Department at New Mexico State University (NMSU) – United States of America. GPA: 4.0

○ **2010 – 2011**: Master of Information Technology - Major: Business Informatics, James Cook University, Australia. Graduated with an honours degree. GPA: 3.75

○ **2003 -2008**: Bachelor of Information Technology – Major in Information Technology at Hanoi University of Technology - Vietnam. Graduated with an honour degree, ranked as the second highest performance student. GPA: 3.8

TECHNICAL EXPERTISE

○ Expert knowledge, skills and experience of programming languages: JAVA & its frameworks (Struts, Spring, Hibernate), Python & its frameworks, C#, VB.NET, C, C++, Objective-C, Swift, GO language, Rust, NodeJS & its frameworks, Answer Set Programming, Prolog, JavaScript and Libraries, AngularJS, ReactJS, SQL & PLSQL, Perl, Ruby & Ruby on Rails, PHP, Dart and R language.

○ Strong problem solving and critical thinking skills.

○ Web development: JQuery, Bootstrap, HTML5, CSS3, JavaScript and Libraries (AngularJS, ReactJS, etc), PHP & its framework, ASP.NET, Ruby on Rails and Java EE (Struts, Spring, Hibernate).

○ Data Mining and Machine Learning Tools: R packages, Weka, Scikit-Learn, TensorFlow, PyTorch.

○ Artificial Intelligence Programming Language: Answer Set Programming (ASP), Prolog, FOL, Ontology, Action Description Languages (PDDL, AL, ADL, etc.).

○ Natural Language Processing: Stanford CoreNLP, Grammatical Framework, Attempto Controlled NL.

○ Databases: Oracle Database, SQLServer, MySQL Database, PostgreSQL; and NoSQL Database Technology especially on MongoDB, Cassandra, Redis, FireBase, CouchDB, and PouchDB.

○ Big-data processing frameworks: Map-Reduce, Apache Hadoop, and Apache Spark.

○ Mobile Development: Native iOS (Swift, Objective-C), Native Android both NDK and SDK (Java, Kotlin and C), Hybrid Apps (Cordova, IONIC, PhoneGap, NativeScript, React)

- Cloud Computing: Google App Engine, Google Cloud API, Google Cloud Data-store, Google Computer Engine, AWS Elastic Beanstalk, AWS EC2, FireBase.

- Operating Systems Platform: Window, LINUX, Unix

- Automatic testing/build frameworks and Continuous Integration: Selenium and Appium, Jenkins, and Travis.

- IDE: IBM Websphere Application Developer, IBM Websphere Application Server, Visual Studio .NET, Eclipse for J2SE, J2EE, Eclipse for PHP, Rational Rose, Offices, NetBean, R Studio, XCode.

- Other skills: Git (GitHub, Bitbucket), Communication.

RESEARCH INTERESTS

- **Artificial Intelligence:** Knowledge Representation and Reasoning (Argumentation, Logic Programming, Answer Set Programming, Nonmonotonic Reasoning), Reasoning about Actions and Changes, Planning, Scheduling, Autonomous Agents, Robotics, Control Theory, Inductive Logic Programming, Web Services Composition & Semantics Web.

Automation Web Services Composition in Semantics Web. I am researching and developing a completed end-to-end AI system (Web Services Composition Framework) to collect requirements from users in the Natural Language process and explore/execute workflows that can satisfy user requirements automatically. Refinement, modification and interactions with workflows are advanced features in our framework as well as the recovery function and repairing. In this framework, Planning Engine is the most important component, and it is developed based on Answer Set Programming ASP.

Cyber-Physical System. I am working on the knowledge representation and sophisticated reasoning in Cyber-Physical System (CPS) using Logic Programming (Answer Set Programming) to specify and reason about the problems, concerns, satisfactions and answer the complicated queries for any CPS system based on NIST Ontology.

- **Machine Learning and Collective Intelligence:** recommendation system, discovering groups, searching and ranking, collaborative filtering, document filtering, generative modelling, advanced classification, regression.

- **Data Mining and Knowledge Discovery:** Combine Data Mining and Knowledge Discovery with available methods of classification, clustering, association rules to construct special methods to mine data. Build smart systems such as Recommendation System, Finding Similarity, Collaborating Filtering, Social networking.

- **Big Data Processing.** Map-Reduce Framework

Publications

- Joshua Beniston, Adam Beh, Thanh Nguyen, Lilian Ndungu, Jason Karl, Jeffrey Herrick. **The Land Potential Knowledge System: Generating site-specific estimates of land potential productivity and degradation risk using a mobile application and cloud computing**. 2015 AgMIP 5th Global Workshop – *Applied Science Workshop paper*

- Thanh Hai Nguyen, Tran Cao Son, Enrico Pontelli. **Automatic Web Services Composition for Phylotastic**: PADL 2018 20th International Symposium on Practical Aspects of Declarative Languages. ***ACM Springer – Los Angeles, USA***. *Conference Full-Paper*.

- Thanh Hai Nguyen, Tran Cao Son, Enrico Pontelli. **Phylotastic: An Experiment in Creating, Manipulating, and Evolving Phylogenetic Biology Workflows Using Logic Programming**. ICLP 2018 34th International Conference on Logic Programming. **TPLP Theory and Practice of Logic Programming Journal**. *Conference Full-Paper and Journal Research.*

- Thanh H Nguyen. **An Automatic Web Services Composition Framework over Biological Domain and Specifications**. LPNMR 2019. The 15th International Conference on Logic Programming and Nonmonotonic Reasoning LPNMR 2019. *Doctoral Consortium presentation*

- Thanh H Nguyen, Van D. Nguyen, Abu Saleh Md. Tayeen, H. Dail Laughinghouse IV, Luna L.Sanchez-Reyes, Enrico Pontelli, Dmitry Mozzherin, Brian O'Meara, Arlin Stoltzfus. **Phylotastic: Improving Access to Tree-of-Life Knowledge with Flexible, on-the-Fly Delivery of Trees**. Evolutionary Bioinformatics Journal 2020. *Journal Research Paper*.

- Abu Saleh Md Tayeen, Thanh H Nguyen, Van Nguyen, Enrico Pontelli. **Design and Implementation of Phylotastic, a Service Architecture for Evolutionary Biology**. International Journal of Software Engineering and Knowledge Engineering IJSEKE 2020. *Journal Research Paper*
- Thanh H Nguyen, Tran Cao Son, Enrico Pontelli. **On Repairing Web Services Workflows**. The 22nd International Conference on Practical Aspects of Declarative Languages PADL 2020. ***ACM Springer - New Orleans, LA***. *Conference Full-Paper*.
- Thanh H Nguyen, Tran Cao Son, Matthew Bundas, Marcello Balduccini, Kathleen Campbell Garwood, Edward R. Griffo. **Specifying and Reasoning about Concerns in Cyber-Physical System Using Answer Set Programming**. KR-2020 17th International Conference on Principles of Knowledge Representation and Reasoning. *Poster presentation*
- Thanh H Nguyen, Tran Cao Son, Matthew Bundas, Marcello Balduccini, Kathleen Campbell Garwood, Edward R. Griffo. **Reasoning about Trustworthiness in Cyber-Physical Systems Using Ontology-Based Representation and ASP**. PRIMA-2020 The 23rd International Conference on Principles and Practice of Multi-Agent Systems. *Conference Full-Paper*

- Thanh H Nguyen, Tran Cao Son, Matthew Bundas, Marcello Balduccini, Kathleen Campbell Garwood, Edward R. Griffo. **Specifying and Reasoning about CPS through the Lens of the NIST CPS Framework**. ACM Transactions on Cyber-Physical Systems – Special Issue on Artificial Intelligence and Cyber-Physical System. *(pending)*

- Matthew Bundas, Chasity Nadeau, Thanh H Nguyen, Jeannine Shantz, Marcello Balduccini, Tran Cao Son. **Towards a Framework for Characterizing the Behavior of AI-Enabled Cyber-Physical and IoT Systems**. In 2021 IEEE World Forum on Internet of Things (WF-IOT 2021). *Full-paper*