

Hung Cao

Curriculum Vitae

People in Motion Lab (Cisco Big Data Analytics)
University of New Brunswick
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I have experienced in Data Science and the related fields. At the People in Motion Lab, I try to develop a new framework called Analytics Everywhere for exploring the IoT data streams using the combination of Edge Computing, Fog Computing and Cloud Computing.

Education

- Feb 2018 **Diploma in University Teaching**, *University of New Brunswick*, Fredericton, Canada.
- May 2016 – Present **PhD in Geomatics Engineering**, *University of New Brunswick*, Fredericton, Canada, *GPA: 4.0/4.3.*
- *Supervisor:* Dr. Monica Wachowicz and Dr. Chiara Renso
 - *Emphasis:* Big Data Analytics, Internet of Things, Edge Computing, Fog Computing, Cloud Computing
 - *Tentative Thesis:* Developing an analytics everywhere framework for the Internet of Things
 - *Relevant Course:* Intro to Big Data & Data Science, Machine Learning and Data Mining
 - University of New Brunswick's Doctoral Scholarship
- Sep 2014 – Nov 2015 **MSc in Computer Science**, *University College Dublin*, Dublin, Ireland, *GPA: 3.83/4.2.*
- *Supervisor:* Dr. NhienAn LeKhac
 - *Emphasis:* Machine Learning, Cloud Computing
 - *Thesis:* A new approach to process massive LiDAR data on the cloud computing environment
 - *Relevant Course:* Virtualisation and Cloud Computing, Machine Learning, Distributed Systems.
 - 1st Class Honours
- Oct 2006 – May 2011 **BEng in Computer Engineering**, *University of Information Technology, VNU-HCM*, Ho Chi Minh City, Vietnam, *GPA: 7.51/10.*
- *Supervisor:* Dr. Vu Duc-Lung
 - *Emphasis:* Control System
 - *Thesis:* Comparative study on controlling approaches and an experimental model for musical fountain (Score: 9.4/10)
 - *Relevant Course:* Object-Oriented Programming, Data Structures, Computer Architecture.
 - Rank: 5/100

Experience

Research Experience

- May 2016 – Present **Researcher**, *University of New Brunswick.*
- Big data analytics for the Internet of Things data streams (Funded by Cisco)*
- Building the Edge-Fog-Cloud architecture
 - Novel analytics methodology for IoT data streams
 - *Other research projects:*
 - Big data analytics to improve transit system in Moncton City collaborating with Codiac Transit & The Black Arcs (Funded by NSERC Engage)
 - Smart parking in Saint John City project working with HotSpot Company
- Oct 2014 – Nov 2015 **Research Associate**, *University College Dublin.*
- *Research project:* High performance computing for massive LiDAR Data processing.
 - Research, analysis, and building the algorithms in Python for kd-tree, Octree, k Nearest Neighbor
 - Employ Hadoop MapReduce to compute LiDAR data in parallel fashion
 - Deploy big LiDAR data on the Cloud Computing environment and develop visualization software

Jun 2011 – Aug 2014 **Researcher**, *University of Information Technology, VNU-HCM*.

- *Research project*: Implementing a musical fountain controlling system based on the frequency analysis using FFT algorithm (Funded by VNU-HCM)
- *Research project*: Analysis and Synthesis Vietnamese Speech (Funded by UIT). - Senior member of Vietnamese Speech Processing Group
- *Research project*: Hand-pose sign language recognition system for hearing-disable people (Funded by UIT).

Teaching Experience

Winter 2017 **Co-supervisor**, *University of New Brunswick*, Design Project, Number of Students: 3.

Spring 2016 **Lecturer**, *University of Information Technology, VNU-HCM*, Course Title: Operating System, Number of Students: 99.

Spring 2013 **Teaching Assistant**, *University of Information Technology, VNU-HCM*, Course Title: Mobile Device Programming, Number of Students: 100.

Fall 2012 **Lab Instructor**, *University of Information Technology, VNU-HCM*, Course Title: Fundamentals of Embedded Programming, Number of Students: 50.

Spring 2012 **Lab Instructor**, *University of Information Technology, VNU-HCM*, Course Title: Verilog and VHDL Programming, Number of Students: 50.

Fall 2011 **Teaching Assistant**, *University of Information Technology, VNU-HCM*, Course Title: Computer Architecture, Number of Students: 100.

Industry Experience

Dec 2017 – Present **Cloud Administrator**, *People in Motion Lab*.

- Managed and operated the cloud infrastructure systems provided by Compute Canada.
- Installed, configured and allocated virtual cloud instances to other members in the lab.
- Supported cloud servers including security configurations, patching, and troubleshooting.

Oct 2010 – Mar 2011 **Embedded System Developer**, *CanhViet Co, Ltd..*

- Interned as an embedded system developer.
- Built smart, embedded systems and automatically musical fountain controlling system.

Jan 2008 – Jan 2009 **Senior Member**, *CERobo Team of UIT*.

- Senior member of the team representing for University of Information Technology took part in Vietnam Robot Contest (ROBOCON 2008) which was held by Vietnam Television – VTV.
- In charge of instruction for young students to participate in this competition next year.

Nov 2006 – Dec 2007 **Software Developer**, *Self-Employed*.

- Self-employed developer
- Junior research assistant at Department of Computer Engineering, UIT.

Publications

- **Cao, H.**, Wachowicz, M., Renso, C., & Carlini, E. (2019). Analytics Everywhere: generating insights from the Internet of Things. (*under a journal submission*)
- **Cao, H.**, & Wachowicz, M. (2019). The design of an IoT-GIS platform for performing automated analytical tasks. In *Computers, Environment and Urban Systems Journal*, Volume 74, (pp 23-40).
- **Cao, H.**, Wachowicz, M., Renso, C., & Carlini, E. (2017). An edge-fog-cloud platform for anticipatory learning process designed for Internet of Mobile Things. arXiv preprint arXiv:1711.09745.
- **Cao, H.**, Wachowicz, M., Cha, S. (2017, December). Developing an edge computing platform for real-time descriptive analytics. In *Big Data (Big Data)*, 2017 IEEE International Conference on. IEEE.
- Maduako, I., **Cao, H.**, Hernandez, L., & Wachowicz, M. (2017, October). Combining edge and cloud computing for mobility analytics. In *Proceedings of the Second ACM/IEEE Symposium on Edge Computing* (p. 22). ACM.
- Hernandez, L., **Cao, H.**, & Wachowicz, M. (2017). Implementing an Edge-Fog-Cloud architecture for stream data management. In *IEEE Fog World Congress 2017*. Oct 30 - Nov 1, 2017, Santa Clara, CA, USA

- **Cao, H.**, & Wachowicz, M. (2017). The design of a streaming analytical workflow for processing massive transit feeds. In 2nd International Symposium on Spatiotemporal Computing, Harvard University, Cambridge, MA, USA.
- **Cao, H.** (2017). What is the next innovation after the internet of things?. arXiv preprint arXiv:1708.07160. (*technical report*)
- Cha, S., Ruiz, M. P., Wachowicz, M., Tran, L. H., **Cao, H.**, & Maduako, I. (2016, December). The role of an IoT platform in the design of real-time recommender systems. In Internet of Things (WF-IoT), 2016 IEEE 3rd World Forum on (pp. 448-453). IEEE.
- **H Cao**, I Maduako, E Cavalheri, R Brideau, M Wachowicz. The Role of Graph Databases in Geomatics, Geomatics Atlantic 2016, Sep 26, 2016, Fredericton, Canada.
- **Hung Cao**, Ikechukwu Maduako, Emerson Cavalheri, Ryan Brideau, Monica Wachowicz. How can graph databases improve transit systems?, UNB Research Showcase, Sep, 2016, Fredericton, Canada.
- **V-H. Cao**, K-X. Chu, N-A. Le-Khac, M-T. Kechadi, D. Laefer, L. Truong-Hong. Toward a new approach for massive LiDAR data processing, IEEE International Conference on Spatial Data Mining and Geographical Knowledge Services, July 08-10, 2015, Fuzhou, China.
- Lung Vu Duc, **Hung Cao Van**, Quoc Nguyen Viet, Loc Nguyen Phuoc. Analysis of Vietnamese Tones to optimize database in speech synthesis using unit selection method, IEEE International Symposium on Signal Processing and Information Technology, December 12-15, 2012 - Ho Chi Minh City - Vietnam (ISBN 978-1-4673-5604-6)
- **Hung Cao**, La Le, Duy Phan, Lung Vu. Musical fountain modeling, controlled by audio frequency analysis using FFT algorithm, National Conference on Information Technology, CanTho, Vietnam, 2011 (in Vietnamese)

Honors and Awards

- **Eugene E. Derenyi Graduate Academic Achievement Award 2018** – University of New Brunswick.
- **School of Graduate Studies Travel Award 2017** – University of New Brunswick.
- **Graduate Research Assistantship 2016-2020** – University of New Brunswick.
- **Graduate Academic Assistantship 2016-2020** – Cisco/NSERC IRC.
- **International graduate differential fee scholarship 2016-2020** – University of New Brunswick.
- **UCD Research Scholarship 2014-2015** – University College Dublin.
- **Irish Aid IDEAS Scholarship 2014-2015 (Strand II - Technical Area)** – Department of Foreign Affairs and Trade - Government of Ireland.
- **Annual scholarships for outstanding students 2006-2011** – University of Information Technology.
- **Scholarship for excellent students 2007** – SKT-SSU IT Training Center (Vietnam), sponsored by SK Telecom and Soongsil University (Korea).

Qualifications

Jan 11th 2019	<i>BigDat 2019 - The 5th International Winter School on Big Data, University of Cambridge</i>
Nov 12th 2017	<i>Certificate of Completion - Deep Learning Fundamentals, Cognitive Class</i>
Jan 7th 2017	<i>Certificate of Completion - Data Science Methodology, Big Data University</i>
May 30th 2016	<i>Certificate - Neo4j Certification, Neo4j Certified Professional</i>
May 19th 2016	<i>Certificate of Completion - Introduction to R, DataCamp</i>
Nov 18th 2015	<i>Certificate of Achievement - Introduction to Data Analysis using R, Big Data University</i>
Nov 3rd 2015	<i>Certificate of Achievement - Introduction to NoSQL and DBaaS, IBM - Big Data University</i>
Oct 28th 2015	<i>Certificate of Achievement - Spark Fundamentals II, IBM - Big Data University</i>
Jul 30th 2015	<i>Certificate of Achievement - Introduction to Solr, IBM - Big Data University</i>
Jun 1st 2015	<i>Certificate of Achievement - Big Data Fundamentals, Big Data University</i>

May 23th 2015 *Certificate of Achievement - Introduction to MapReduce Programming, IBM - Big Data University*

May 19th 2015 *Certificate of Achievement - Hadoop and the Amazon Cloud I, Big Data University*

May 19th 2015 *Certificate of Achievement - Hadoop and Fundamentals I, IBM - Big Data University*

Apr 6th 2011 *Certificate of Participation on Nokia Technology Workshop, Vietnam*

Oct 16th 2009 *Certificate for completing the Training Program on Model Training Program on IT Fundamental Engineer Exam Preparation which was held by Japan External Trade Organization (JETRO) and Vietnam Training and Examination Center (VITEC) under the support of the Ministry of Science and Technology of Vietnam - Sep 14th - Oct 16th 2009, Ho Chi Minh City, Vietnam*

Professional Service

Organizing member Hackathon on Geospatial Intelligence in the National Capital Region 2018 - Ottawa, Canada

Membership IEEE Communities: Cloud Computing; Big Data; Internet of Things; Smart Cities; Transportation Electrification; Software Defined Networks.

Reviewer International Journal of Parallel, Emergent and Distributed Systems; Big Data and Cognitive Computing Journal; Future Internet Journal; Data in Science Journal

Technical skills

Languages Python, Scala, R, Java, C/C++, C#, Java Scripts, HTML, PHP, .NET, XAML

Other Languages Linux shell scripts, Assembly, VHDL, Verilog, Embedded C

Database SQL, MySQL, NoSQL (Neo4j, MongoDB, RethinkDB, HBase), DBaaS

OS Linux, Windows Server, Windows, Windows Phone, Symbian, Android, Mac OS, iOS

IDE Netbeans, Eclipse, Microsoft Visual Studio, SQL Server, Management Studio, SVN

Other GitHub, Hadoop, Spark, Flink, YARN, MapReduce, Samza, Kafka, MXNet, Hive, ArcGIS, QGIS, Tableau, Power BI, Compiler, Qt, Latex, Embedded Systems

Languages

Vietnamese **Native**

English **Professional working proficiency** *IELTS 6.5 Overall (all components at 6.0 & above)*

References

Available upon request.