TUNG HOANG

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WORK EXPERIENCE

RESEARCH PROJECTS, UIC, Chicago, IL *2014-present*

- **RSA Encryption/ Decryption:** Designed and implemented fast algorithm to encrypt data using public key and decrypt data using private key. Built user-defined BigInt class to hold big integers, with methods for fast multiplication, division, greatest common divisor, modulo, exponentiation. Written in **Java**.
- **Monopoly Game:** Designed and implemented the board game Monopoly. Included 2 major components: (1) back end with classes to model players and different kinds of locations and functionalities on the game board and (2) front end with a model of the game with user interaction. Leveraged inheritance and polymorphism in OOP. Written in **Java**.
- **Netflix Database**: Designed a database containing Netflix's movies information. Updated, deleted, inserted data into the database using **C++**. Analyzed data to extract important information such as top reviewed, top average rating, top users. Implemented another version using .NET framework: used **ADO.NET** to access the database, built GUI form of the application using **C#**. Improved the application using **N-tier** design. Updated the database using Transaction, allowing rollback if errors encountered. Written in **C++/ C#/ SQL**.
- **Swype**: Designed and implemented an algorithm to generate a best guess with top 3 most popular alternatives from a *swype* on a QWERTY keyboard. Searched for words based on matches of the first and last characters, minimum length and appearance of all characters. Implemented another version using **F#**. Written in **C++/ C#**.
- **Planar Graph Determination**: Devised a naive algorithm to determine whether or not a given graph is planar using Kuratowski's theorem. Improved linear-time algorithm for planarity testing. Written in **C/ C++**.

RESEARCH ASSISTANT IN BIOINFORMATICS, UIC, Chicago, IL *2012-present*

- Applied Artifical Neural Network (**ANN**) to differentiate Enhancers from nonfunctional regions within DNA sequence. Designed and implemented algorithms to classify biological data using Discrete Fourier Transform (DFT), Voronoi diagram, Chaos Game Representation (CGR), and Hausdorff distance. Written in **Matlab/ Python.**
- **PS-M:** Designed and implemented **P**ower **S**pectrum-**M**oment method to classify genomes and genes using Discrete Fourier Transform (DFT) and power spectrum. Performed cluster analysis to analyze biological sequences using **PS-M**, improved speed up to 15 times while keeping accuracy on several cases. Written in **Matlab/ R/ C++**.

SKILLS

- *Proficient:* Java, C, C++, Matlab, F#, SQL, C#, Python, R, ADO.NET, Maple, Threading.
- *Prior experience:* SAS, SPSS, JavaScript, Mathematica, HTML, Linux Shell Script, Parallel Programming.

EDUCATION

University of Illinois at Chicago (UIC), Chicago, IL
Ph.D Candidate in Applied Mathematics, GPA: 3.73/4.0 *August 2017*
Master of Science in Computer Science, GPA: 3.8/4.0 *May 2017*
Master of Science in Pure Mathematics, GPA: 3.92/4.0 *May 2011*
Selected courses: Machine Learning, Data Mining and Text Mining, Artifical Neural Network, Artificial Intelligence I, Database Systems, Computer Systems, Operating Systems, Software Design with Java, Statistical and Probability Theory, Computer Algorithms I, Computational Geometry, and Graph Theory.

Honors Program, Vietnam National University, Hanoi, Vietnam
Bachelor of Science in Mathematics, GPA: 3.7/4.0 *May 2006*

PUBLICATION

- **Hoang, Tung**, Changchuan Yin, and Stephen S-T. Yau. "Numerical encoding of DNA sequences by chaos game representation with application in similarity comparison." *Genomics* (2016).
- **Hoang, Tung**, et al. "A new method to cluster DNA sequences using Fourier power spectrum." *Journal of theoretical biology* 372 (2015): 135-145.

AWARDS/ ACTIVITIES

- Student Travel Award for FNFYT, CIMPA *2010, 2012*
- Coordinator of International Football Club at UIC *2011- present*
- Vietnam Education Foundation Scholarship *2009*
- Scholarship of Rencontres du Vietnam *2006*