Programming Competency Statement

Relevant Programming Coursework

- Human-computer Interaction with Mobile Phones and Services (Objective-C), *2011*
- Software Design Patterns (Java / C#), *2010*
- Design Strategies for Computer Algorithms (C++), *2010*
- Parallel Programming (C++ – MPI / Java – MapReduce), *2010*
- Computer Network (C / C++), *2009*
- Systems Programming (C / C++), *2009*
- Information System (Java / UML), *2008*
- Object-oriented Software Design (Java), *2008*
- Introduction to Computer Programming (C / C++), *2007*

C and C++

- Wrote over one hundred C and C++ programs in UVA online judge system and courses
- Refractored an open source project, "RecastNavigation," which is developed to do path finding in a 3D map in C++, with Message Passing Interface (MPI) to speed up the bottleneck of building a large map's NavMesh by paralleling the process on multiple-core platform
- Used DSL like Matlab or Octave to cooperate with C++ when requiring some numerical analyses and signal processing
- Implemented dozens of algorithm and data structure related programs in C and C++
- Used C++ to implement a file transferring agent to access two FTP servers simultaneously
- Implement a web proxy server with cache function in C++
- Implemented system programs and socket programs in C++ such as online text chat room
- Implement a C++ program that performs external merge sort with multiple processes to deal with the large-scale data
- Wrote kernel modules in embedded system in C

Java and C#

- Helped to develop and integrate inference engines that process the contextual information and are implemented in Java
- Implemented Java client programs to obtain and process huge log data from Hbase
- Developed web interfaces using Java Server Pages (JSP)
- Implemented several gateway systems in Java that work with wireless sensors running on TinyOS platform
- Synthesized heterogeneous systems by using the Java Message Service (JMS) like Active-MQ as the message communication interface
- Implemented several Java applications that access two-way serial (COM) ports to do signal processing or actuator controlling.
- Developed several GUI-applications of Java by using the WindowBuilder, a bi-directional Java GUI designer
- Used the tool, JFreeChart, to plot colorful charts such as time-series charts, and pie charts
- Used drivers like JDBC in Java to implement programs interacting with database.
- Learned the software design pattern using in object-oriented languages in the course of Software Design Patterns and practically applied them into Java programs such as Composite Pattern, State Pattern, and Factory Method Pattern

- Utilized the multi-thread supported feature in Java to implement programs especially the GUI (Swing/AWT) programs
- Processed various data-interchange formats such as XML, YAML, JSON
- Used the keyboard-binding and set-hook API in C# to develop the project, Natural Hand, which allows the users to perform interruptive pre-defined commands through gestures (mouse tracks) anytime and anywhere on operating system
- Produced scripts or makefiles to build the java application from source on different platform
- Knew the process of system design through UML diagrams such as class diagram
- Learned various concept of Java and C# in the course of Object-oriented Software Design such as encapsulation, inheritance, polymorphism, interface, exception, multi-thread, and generics

Python

- Used Python with libraries like numpy and matplotlib to analyze the old data from KDD contest, do data clustering, recognize data labels, and visualize data points in the course of Machine Learning
- Wrote dozens of Pythons program to solve the problems on online judge system

Ruby

- Used Ruby to generate tools doing text processing, and data parsing
- Wrote scripts to manage computers or servers such as cleaning unnecessary logs periodically and updating firewall's rule when being the web administrator in lab
- Learned to build interactive website using Rails, the Ruby's famous framework

JavaScript

- Developed and designed the front-end web pages for over two years
- Used jQuery to create dynamic elements in web pages
- Implemented websites using Ajax techniques to exchange data with database

Objective-C

- Implemented a new approach for Chinese input method on iOS system, which categorizes the phonemes in tradition Zhuyin input method into two categories—initial and vowel—such that users can intuitively glide between the phonemes and chose the intentional tone by slightly changing their track pattern