# Xinyao Sun

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**Personal Profile**

I am an organized and efficient Programmer. I was always playing the role as the team leader during the course projects. I have the ability on arrangements for managing during the teamwork. Good at planning and scheduling the work for both group and independent projects. I am also with a high self-learning ability on new technology.

**Technical Skills**

| Skills | Hardware/Software | Detailed Description |
|---|---|---|
| Operation Systems | Microsoft Windows NT<br>Apple OSX<br>Linux | Lifelong experience with most Microsoft operation system. Detailed knowledge of workings of internal Macintosh and Linux. General use with Linux server administration. |
| Programming | C/C++, Objective-C, JavaScript, MATLAB, C#, Java<br>PHP, HTML, Python, CSS, | High ability on C++, Objective-C PHP and JavaScript.<br>Familiar with Qt, Apache Cordova framework and Node.js environment.<br>Skilled on using Microsoft Virtual Studio, Xcode and QtCreator for project development. |
| Design/Content Creation | Autodesk 3ds Max 2013<br>Adobe Photoshop CC/CS6<br>Unity3D | Skilled in design and photo treatment in Adobe Photoshop. 3D model and animation on 3ds Max. Knowledge basic skills on Unity3D |
| Specific Computer Design | OpenGL<br>Leap Motion Sensor<br>Linux Containers (LXC)<br>Apache Hadoop<br>OpenStack Storage | Skilled in implementing virtualization 3D environment based on motion sensor (Leap Motion) with OpenGL. Experience in LXC setting |

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| | | up and distribution. Building the connection among the LXCs and host. Setting up multi-node Hadoop cluster on Amazon EC2. |

**Academic Research:**

Ground Truth Delineation for Medical Image Segmentation based on Local Consistency and Distribution Map Analysis
Role: Researcher and Programmer
Language/Framework: (Java/MatLab)
In this study, we propose a Segmentation Quality Assessment (SQA) Model and introduce a local consistency analysis approach, which can serve two purposes: (i) to help establish a ground truth; and, (ii) to compare segmentation results with ground truth data.

Application of a Novel Optical Motion Analysis Instrument for Objective Evaluation of Surgical Movement
Role: Researcher and Major Programmer
Language/Framework:(C++/MatLab), (OpenGL/Qt)
This study demonstrates the use of the marker-less technique for objectively measuring Moreover, assessing surgical dexterity among users with different levels of training. I utilized a Leap Motion Controller to obtain motion data and propose a Hidden Markov Model for motion analysis.

Sensor-Based Cloud Computing Interface (CCI) - for Motion Analysis as a Performance Metric and Education Tool
Role: Researcher and Major Programmer
Language/Framework:(C++/MatLab/Python), (OpenGL/Qt/Flask)
Using data captured by smart sensors to deploy a Cloud Computing Interface in the Cloud infrastructure. To achieve the benefit from processing, analyzing, evaluating and storing fine motion data. I devloped a local client software which using the Linux Container technique to create each isolated linux system for each sensor.

**Highlight Course Projects:**

Myo-Cookbook on IOS device
Language/Framework:(Obj-C),(Cocoa Touch)
Role: Major Programmer

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Using Myo-Armband, which is a wearable device to detect hand movements and gestures, as the controller to allow the user to interact the Cookbook app on IOS devices. I designed the program's framework and manage the task lists for the group.

Real-Time Hand Gesture Detection Using Haar-Like Features
Language/Framework:(MatLab)
Role: Independent work
I described a vision-based hand posture classification. The low level of the implementation is using the Haar-like features and the Adaptive Boosting (AdaBoost) machine learning algorithm for posture recognition.

Hand Motion Fusion Based on Multi-Leap Sensors
Language/Framework:(C++),(Qt/OpenGL)
Role: Independent work
I proposed an fusion algorithm that increased the robustness of Leap Motion Sensors poses estimation by combining the spatial and temporal domain analysis from multiple sensors that placed on a different view of the position.

Animation Retargeting:
Role: Team leader and major Programmer
Language/Framework: (C++), (OpenGL)
Retargeting the animation from the given source motion data that already included a human skeleton and motion information to the target human skeleton. Two skeletons have different bone size and initial pose but the same number of bone and topological. I proposed the main algorithm and implemented it in a toolbox.

Display for Training Anatomy:
Role: Team Leader and Major Programmer
Language/Framework: (C++), (Qt/VTK)
Developed an application to an interactive surface for anatomy training of medical intern. The application is able to display 3D medical image on Windows platform. The 3D model can be rotated and slicing by the animation from the user. Using the OptiTrack system to track the marker's animation on the remote. I played a role as project manager and core programmer. I designed the system and gave each person's sub-task. I also toke charge of merging each person's work to the main branch.

Automatic Rigging and Animation of 3D Characters
Role: Independent work

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Language/Framework: (C++), (OpenGL)
Attached the skin (mesh) to the given human skeletons with T initial pose, automatically. Also, enable the animation on it by importing the BVH motion file.

**Outsourcing Experience:**
Apple IOS Client for Third party futures trading Platform Company in China
Dec. 2014 ~ Apr. 2015
Role: Independent work
Language/Framework: (C++/Obj-C),(Cocoa Touch)
Design and implement the IOS client app for a futures trading Platform Company from China, let its customers monitor the market data and take real time trading under its server's risk control system through Apple IOS devices. I also toke part in the design and implementation on server side's restful API.

Web-App on backstage Dashboard for Risk Management Platform Company
Feb. 2015 ~ Jun. 2015
Role: Major Programmer
Language/Framework: (JavaScript/PHP/C#), (BootStrap/jQuery/Asp.net)
Construct a website back-stage management system for a futures risk management company in China. The system allows customers to monitor their capital account and manages the investment strategy online in real time. I designed the architecture of system at the beginning and worked as a coordinatior between the company and our development group.

**Others:**
Mobile Game Design and Implement
http://www.gamecloudgame.com
Jan. 2014 ~ Dec.2014
Role: Major Programmer, CTO
Language/Framework: (C++/Obj-C), (Cocoa Touch/Cocos2D-x/Apache Cordova)
As a co-founder of a start-up team, contributing the mobile games on IOS and Android, has already published four games. Moreover, reached 500K downloads in total.

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**Education**

2010 - 2015 University of Alberta, Alberta Canada
Bachelor of Science with Specialization in Computing Science

2015 – Present University of Alberta, Alberta Canada
Master of Science in Computing Science with Specialization in Multimedia

**Publications**:

1. I Cheng, XY Sun, N. Alsufyani, Z. Xiong, P. Major and A. Basu, "Ground Truth Delineation for Medical Image Segmentation based on Local Consistency and Distribution Map Analysis," IEEE Engineering in Medicine and Biology Conference (EMBC), 2015.
2. XY Sun, S. Byrns, I. Cheng, B Zheng and A. Basu, "Smart Sensor-Based Motion Detection System for Objective Measurement of Hand Movements in Open Surgery", Journal of Medical System. (Submitted)
3. XY Sun, I. Cheng, A. Basu, "Multi-Sensor Motion Fusion Through Spatial-Temporal Optimization", 2016 IEEE International Conference on Image Processing (ICIP),2016. (Submitted)
4. XY Sun, I. Cheng, A. Basu, "Tele-Surgery Simulation for Robotic Endovascular Procedure with Touchless Human-Computer Interface", 38th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC),2016. (Submitted)