用MOOC转专业
——从人大农业经济到Brown计算机科学

中国人民大学 卢山

世毕盟学员申请经验交流会 · 人大专场

2015.3.27

个人背景介绍

- 中国人民大学2010级农发学院本科生，农林经济管理(Overall GPA 3.66/4.0)
- 人大校长奖学金2012年第一批UC Davis交换生(Overall GPA: 3.97/4.0)
- 副修数学与应用数学第二学位(截止申请提交 GPA: 3.63/4.0)
- TOEFL: 108(R30, L29, S22, W27)
- GRE: 324(V154, Q170, AW3.5)
- 有实习、科研经历，但没有突出成果
- 12门MOOC(Massive Open Online Courses，大规模在线公开课)计算机课程证书
- 申请方向：计算机科学(Computer Science, abbr. CS)

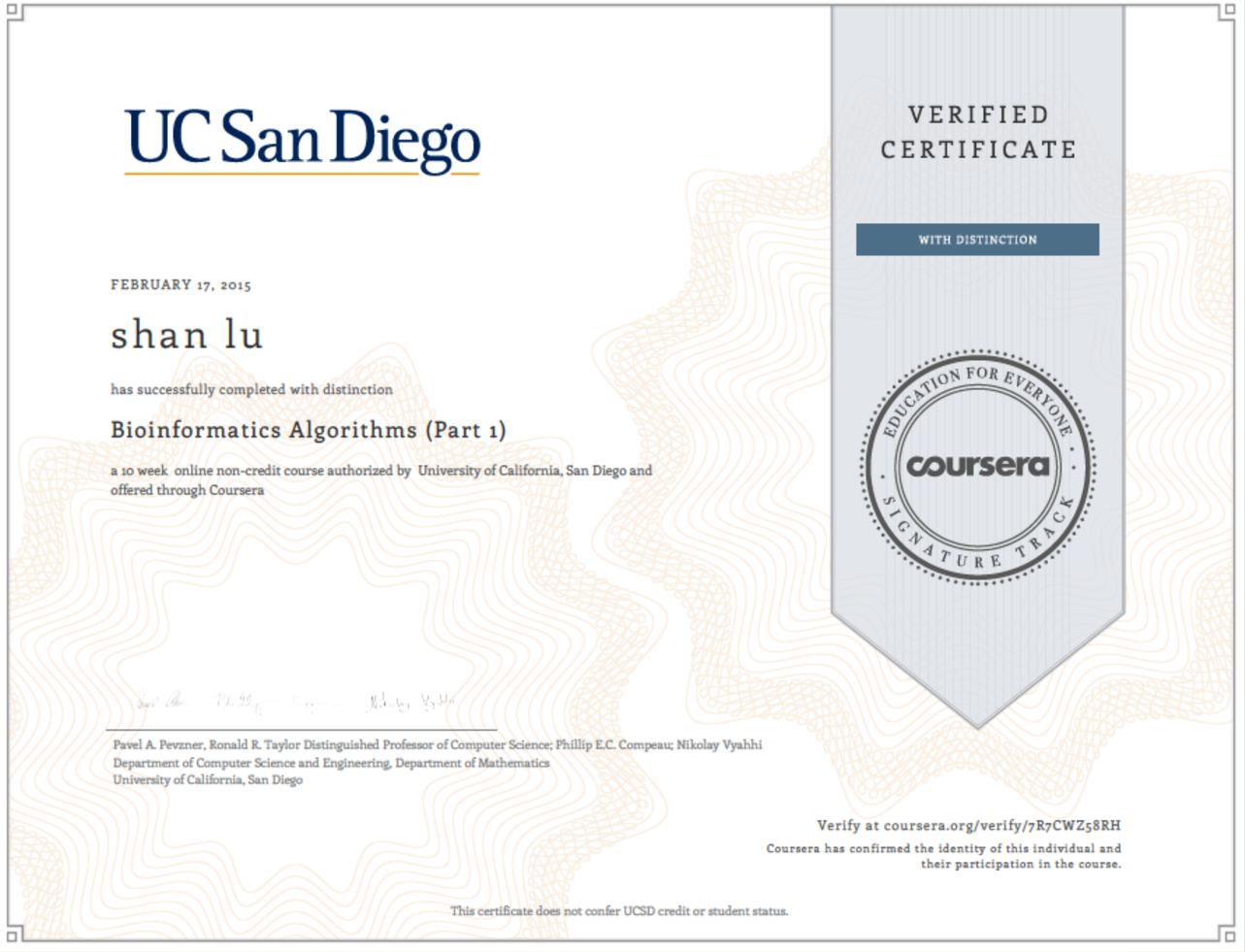
申请结果(截止3.27)

- 11 submitted, 3 Admission, 3 Rejected, 6 Pending
- Accepted: CS@Brown University
- Admission: CS@Brown, CS@UC Davis, ECE-SE@CMU Silicon Valley
- Rejected: MIIS(智能信息系统)@CMU, EECS M.Eng@UC Berkeley, CS@UCSD
- Pending: CS@Columbia, U Michigan, UC(LA, Irvine), USC, UChicago

如何搞定Dream School?

UCSD和Brown的故事

如果只有一张梦校的MOOC证书，够吗?



UC San Diego

VERIFIED CERTIFICATE

WITH DISTINCTION

FEBRUARY 17, 2015

shan lu

has successfully completed with distinction

Bioinformatics Algorithms (Part 1)

a 10 week online non-credit course authorized by University of California, San Diego and offered through Coursera

EDUCATION FOR EVERYONE coursera SIGNATURE TRACK

Pavel A. Pevzner, Ronald R. Taylor Distinguished Professor of Computer Science; Phillip E.C. Compeau; Nikolay Vyahhi
Department of Computer Science and Engineering, Department of Mathematics
University of California, San Diego

Verify at coursera.org/verify/7R7CWZ58RH

Coursera has confirmed the identity of this individual and their participation in the course.

This certificate does not confer UCSD credit or student status.

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UC San Diego Application Decision

收件箱 x

UCSD Graduate Admissions <gradadm3@ucsd.edu>
发送至 我

14:55 (21小时前)

英文 > 中文 翻译邮件 对英文停用 x

Dear Shan Lu,

Your application for graduate study in the Computer Science and Engineering (CSE) program majoring in Computer Science, at the University of California, San Diego has been carefully reviewed. We regret to inform you that you have not been selected for admission.

A number of factors are considered in evaluating each application. Please be aware that UC San Diego receives a very large number of applications and many excellent candidates could not be offered admission. Unfortunately, we are only able to extend offers to a limited number of qualified applicants.

If you have questions about the decision you may contact the Graduate Admissions office and your inquiry will be directed to the department.

Thank you for your interest in the University of California, San Diego. An official letter has been posted on the application status page of your UC San Diego application at https://gradapply.ucsd.edu. I wish you the best in all your endeavors.

Sincerely,

Kim E. Barrett
Dean of the Graduate Division
UC San Diego

Graduate Division, UC San Diego
9500 Gilman Drive
La Jolla, CA 92093-0003
Phone: (858) 534-3554

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Project 1:Image Filtering and Hybrid Images
CS 143: Introduction to Computer Vision

Shan Lu

Applied Mathematics, RENMIN University of China, Beijing

Introduction

The goal of this assignment is to write an image filtering function and use it to create hybrid images using a simplified version of the SIGGRAPH 2006 paper[1] by Oliva, Torralba, and Schyns. Hybrid images are static images that change in interpretation as a function of the viewing distance.

The basic idea is that high frequency tends to dominate perception when it is available, but, at a distance, only the low frequency (smooth) part of the signal can be seen.

By blending the high frequency portion of one image with the low-frequency portion of another, you get a hybrid image that leads to different interpretations at different distances.

Concept

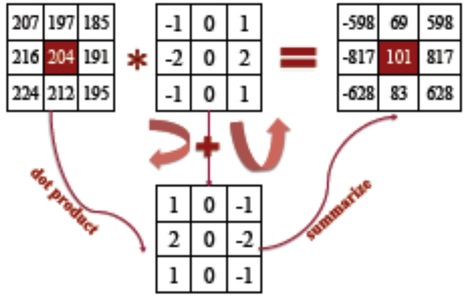
A hybrid image is a picture that combines the low-spatial frequencies of one picture with the high spatial frequencies of another picture producing an image with an interpretation that changes with viewing distance(Oliva *et. al.*). As for this project, we are encouraged to firstly write our own image filtering function, then create several hybrid images(see Figure 1) using our own filtering function.

Figure 1: A hybrid image superimposed by a dog image and a cat image. You will see a cat face from very close while recognizing a doglike face from far away.

Methods

Convolution versus correlation

The built-in function `imfilter(A,h)` in MATLAB will filter the image matrix *A* with filter *h* using correlation method(sum of element-wise dot product) by default. However, the typical convolution computation differs from correlation method by rotating the filter by 180 degrees before computation. Obviously, both approaches give the same output if and only if the filter is symmetric by y-axis. Figure 2 shows how to compute convolution of the red entry with respect to its neighbors.



sobel filter
(non-symmetric by y-axis)

Figure 2: Convolution process

My version of `imfilter(A,h)` matches every checkpoint image well except for the sobel filter. Here is the difference: Edge colors are opposite to each other, especially the orange and blue lines on left side, since the corresponding grayscale values are opposite.

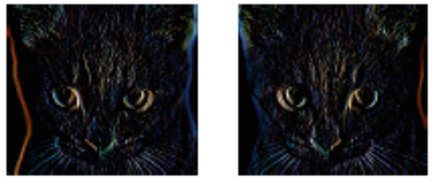


Figure 3: Differences between convolution and correlation

Results

Fig. 4 (a): Original images

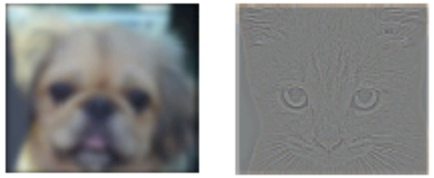


Fig. 4 (b): Frequency extraction: low frequency. from dog image, high frequency extracted from cat image.

Fig. 4 (c): Adding high and low frequencies together and downsampling the hybrid image(for easier recognition purpose).

Fig. 5 (a): From Marilyn to Einstein

Fig. 5 (a): From Einstein to Marilyn

Fig. 6: From two-eye minion to one-eye minion

Disclaimer

The content of this project comes from Brown's CS 143: Introduction to Computer Vision, Fall 2013, taught by Prof. James Hays. All right reserved to Computer Science Department, Brown University. The author is a fanatic self-learning learner in the field of computer vision. All references have been credited.

Project description URL:
http://cs.brown.edu/courses/csci1430/proj1/

References

1. Oliva, Aude, Antonio Torralba, and Philippe G. Schyns. "Hybrid images." ACM Transactions on Graphics (TOG). Vol. 25. No. 3. ACM, 2006.
2. Feifei Li. "Pixels and Filters." Stanford CS131 lecture slides, URL:http://vision.stanford.edu/teaching/cs131_fall1314/lectures/lecture4_pixels%20and%20filters_cs131.pdf, last visited Jan 27th, 2014.

MOOC与转专业

University of California, San Diego
Bioinformatics Algorithms (Part I)

[Score Record]
[Statement of Accomplishment]

University of California, Berkeley
Engineering Software as a Service, Part 1

[Statement of Accomplishment]

École Polytechnique Fédérale de Lausanne
Functional Programming in Scala

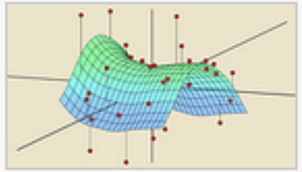
[Statement of Accomplishment]

University of New Mexico
Web Application Architectures

[Statement of Accomplishment]

Massachusetts Institute of Technology
Introduction to Computational Thinking and Data Science

[Statement of Accomplishment]



Stanford University
Statistical Learning

[Statement of Accomplishment]

Stanford University
Introduction to Databases

[Statement of Accomplishment]

John Hopkins University
Computing for Data Analysis

[Statement of Accomplishment]

Georgia Institute of Technology
Computational Investing

[Statement of Accomplishment]

Brown University
Coding the Matrix: Linear Algebra through Computer Science Applications

[Statement of Accomplishment]

Stanford University
Machine Learning

[Statement of Accomplishment]

Rice University
An Introduction to Interactive Programming in Python

[Statement of Accomplishment]

HONOR
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Data Science

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John A Overdeck Professor of Stati
Stanford University

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STATEMENT OF ACCO

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Introduction to Databases

Jennifer Widom, PhD
Professor in Computer Science
Stanford University

PLEASE NOTE:
SOME ONLINE COURSES MAY DRAW ON MATERIAL FROM CO
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UNIVERSITY GRADE, COURSE CREDIT OR DEGREE, AND IT DO

Authenticity of this statement of accomplishment can be verified at: **https://verify.class.stanford.edu/SOA/4ec2807c8**

所谓“从人大农业经济到Brown计算机科学”真的是标题党，什么事情都不会一蹴而就。发现梦想，还要实现梦想。

为什么要转专业:

1. 我想美国找工作，CS最好找
2. 我擅长编程，喜欢熬夜写代码

我做的准备:

1. double major in applied math
2. do research in CS
3. take MOOCs(worthwhile?)

我做的牺牲:

1. 牺牲本专业GPA, course time overlapping
2. 延期毕业，目送同班同学成为研究生师兄师姐

我想学编程，请问该学哪种语言?

- 我想掌握编程思想: Python(学习曲线平缓，语法简单，先学C/C++ = 作死)
- 我想处理数据: R(计量模型、机器学习、时间序列分析等)，MATLAB(矩阵运算)
- 我想搞金融工程/金融数学(MFE/MathFin):以上 & C++(工业级编程语言，快！)
- 我想当程序员：

编程学习资源推荐(入门)

- Python
  - An Introduction to Interactive Programming in Python(Rice, Coursera)编游戏，我的Python入门课
  - Introduction to Computational Thinking and Data Science(MIT, edX) Python和数据科学一起学
  - UC Berkeley CS61A(http://cs61a.org/)
    - UC Berkeley EECS专业/非专业: 编程第一课
    - Berkeley Webcast（http://webcast.berkeley.edu/）

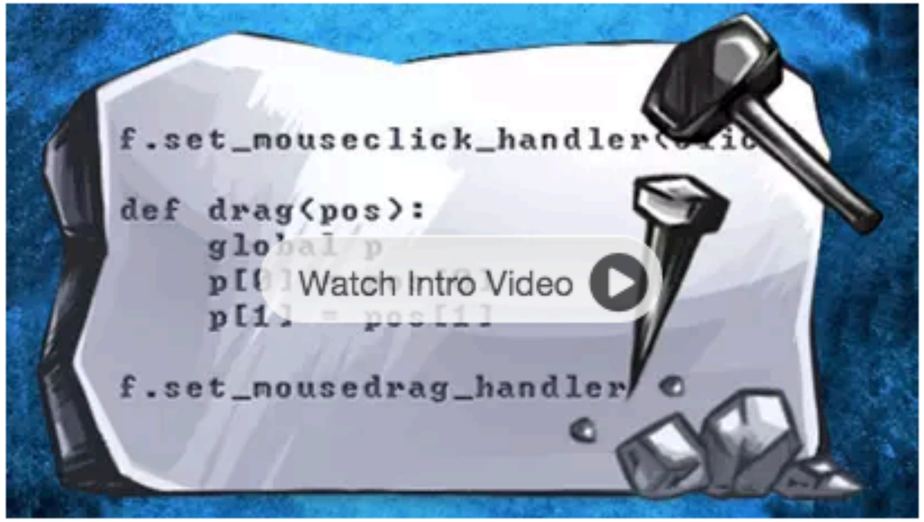
coursera edX Berkeley UNIVERSITY OF CALIFORNIA Stanford University

RICE
Unconventional Wisdom

An Introduction to Interactive Programming in Python (Part 1)

Part of the Fundamentals of Computing Specialization »

This two-part course is designed to be a fun introduction to the basics of programming in Python. Our main focus will be on building simple interactive games such as Pong, Blackjack and Asteroids.



About the Course

This two-part course (part 2 is available here) is designed to help students with very little or no computing background learn the basics of building simple interactive applications. Our language of choice, Python, is an easy-to learn, high-level computer language that is used in many of the computational courses offered on Coursera. To make learning Python easy, we have developed a new browser-based programming environment that makes developing interactive applications in Python simple. These applications will involve windows whose contents are graphical and respond to buttons, the keyboard and the mouse.

The primary method for learning the course material will be to work through multiple "mini-projects" in Python. To make this class enjoyable, these projects will include

Sessions

May 22, 2015 - Jun 27th 2015

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CS 61A

Structure and Interpretation of Computer Programs, Spring 2015

Instructor: John DeNero

Calendar
Resources by Type
Resources by Topic
Weekly Schedule
Additional Resources
Practice Problems
Regrade Requests

Course Info
Extra Lectures
Staff

Announcements

3/20/15 (older) (newer)

- Midterm 2 solutions are posted:
  - Exam
  - Solution

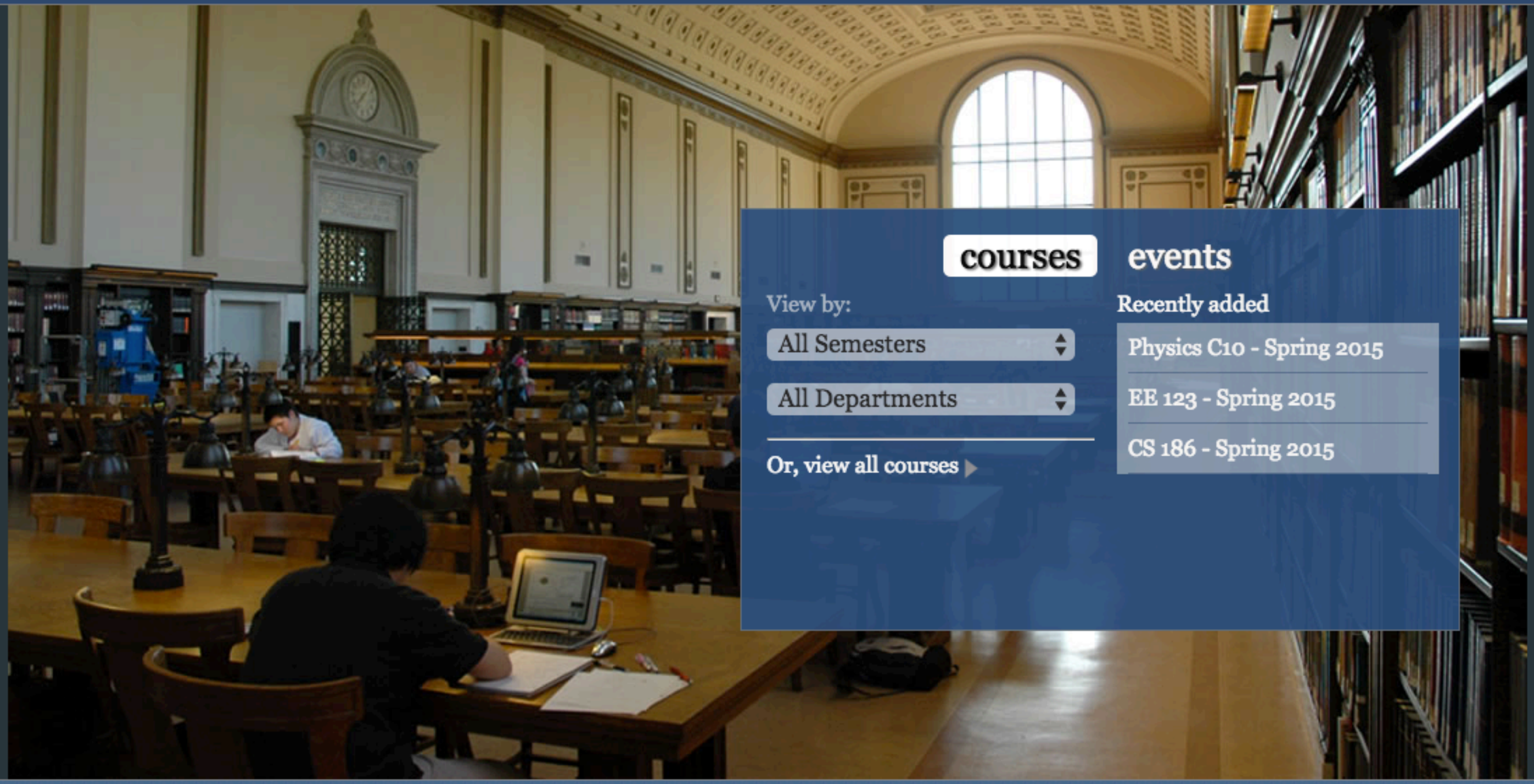
Calendar

Week	Date	Lecture	Reading	Handout	Assignment
1	Wed 1/21	Functions (Video) (1pp) (1pps) (8pp) (01.py)	1.1 1.2	Lab 0: Intro to UNIX Lab 1: Your own machine	
	Fri 1/23	Names (Video) (1pp) (1pps) (8pp) (02.py)	1.3 1.4	Discussion 0: Lost on the Moon (Solutions)	Homework 1 (due Wed 1/28) (Solutions)
2	Mon 1/26	Control (Video) (1pp) (1pps) (8pp) (03.py)	1.5		
	Wed 1/28	Higher-Order Functions (Video) (1pp) (1pps) (8pp) (04.py)	1.6	Lab 2: Functions and Control Structures	Quiz 1 (due Thu 1/29) (Solutions) Hog (due Thu 2/5)
	Fri 1/30	Environments (Video) (1pp) (1pps) (8pp) (05.py)	1.6	Discussion 1: Control Structures and Higher Order Functions (Solutions)	Homework 2 (due Mon 2/2) (Solutions)
3	Mon 2/2	Recursion (Video) (1pp) (1pps) (8pp) (06.py)	1.7		
	Wed 2/4	Tree Recursion (Video) (1pp) (1pps) (8pp) (07.py)	1.7	Lab 3: Recursion	Hog Contest (due Wed 2/18)

webcast.berkeley.edu

webcast.berkeley

webcast.berkeley is UC Berkeley's central service for online video & audio for students and learners around the globe.



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Recently added

Physics C10 - Spring 2015

EE 123 - Spring 2015

CS 186 - Spring 2015

ETS needs your feedback on Classroom Technology Support

编程学习资源推荐(入门)

- R(R is open-source, free)
  - Analytics Edge(MIT, edX)
  - Coursera的Data Science Specialization不推荐
- MATLAB（学完可以搞数学建模比赛）
  - 基础(UC Davis, MAT 22AL)
    - https://www.math.ucdavis.edu/~daddel/MATH22AL/22AL_Home.html
  - 实践(Machine Learning, Stanford, Coursera)
    - https://www.coursera.org/course/ml

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学习资源推荐(进阶:算法+数据结构)

- Java
  - Algorithms(Princeton, Coursera)
  - Stanford CS106A 编程入门课，英语专业的学生都学
    - http://web.stanford.edu/class/cs106a/
  - Berkeley CS61B 数据结构
    - http://berkeley-cs61b.github.io/public_html/
- C/C++
  - Stanford CS 106B/106X 数据结构(C++)
  - Berkeley CS61C, Stanford CS 107(C语言.....)

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申请的杂七杂八

Miscellaneous

- 争取一次出国交换的机会， 提升背景，感受海本生活。USA >> Others
- TOEFL:
  - 低分拖后腿，高分不等于优势，Brown CS TOEFL>105(true), Stanford CS TOEFL>113(false)
  - 新浪微博“**托福苏巍老师**”，口语命中率极高(14.4.27, 6/6 100%)
  - 练听力美剧：《Community College》搜狐视频
- GRE: 够了就行(V153+, Q168+, AW 3.5+)
- 做一个个人网站展示自己(Wix.com)， LinkedIn
- CV的参考(NYU Courant Institute 2012 Resume Book)
- VPN: 云梯VPN
- 文书native speaker润色: wordy(~40刀改一份ps)
- 留学论坛：CS/金工金数/统计 一亩三分地， 金融工程 QuantNet …….
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- 最后一学期成绩有用吗?

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Shan Lu

Applied Mathematics
Renmin University of China, Beijing

Home | Academic | Projects | Experience | CV

Dear commitee,

I'm waiting for your admission notification!

I am a senior undergraduate studying Applied Mathematics at Renmin University of China, Beijing. I obtained my first bachelor degree in Agricultural and Forestry Economics and Management in June, 2014 at Renmin. I am currently applying for Master of Science programs in **Computer Science and Engineering**. On this website, you will find information about my academic performance, reseach projects and activities.

MY CV

Website:
baizhima.github.io

Cell:
+86-159-1063-1322

Email:
lushan.frank at gmail.com

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Troy, Zhenhao Hua

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United States | Computer Software

Current LinkedIn
Previous Carnegie Mellon University, Microsoft Research Asia
Education Carnegie Mellon University

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www.linkedin.com/pub/troy-zhenhao-hua/1b/19/a52/en

Contact Info

Background

Experience

Software Engineer
LinkedIn
July 2014 – Present (9 months)

Research Assistant
Carnegie Mellon University
August 2012 – June 2014 (1 year 11 months)

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