

Overview

Welcome to Startup Engineering! This is the course we wish we'd had before beginning our careers. It's a summarization of what we know about starting technology companies/labs and scaling them up, taken from our experiences building [Counsyl](#) and [Folding@Home](#).

As described in detail [here](#), the first part of the course will cover modern software engineering principles with a focus on mobile HTML5 development, taught via in-class lectures with online questions and programming assignments. Guest lecturers from top Silicon Valley startups (including Uber, Coinbase, Meteor, Square, Stripe, AirBnb, Twilio, Taskrabbit, Judicata, Counsyl, Twitter, and Asana) will bring these concepts to life with real engineering problems from their work.

In the second part of the course, you will run a crowdfunder to attract pre-orders and/or social media attention for your startup product. Specifically, over the course of the homework assignments, you will progressively develop a node.js-based crowdfunding application and populate it with your own startup idea, which you may have brought with you at the outset or else developed over the course of the class. Your crowdfunding app will be prototyped as a simple command line application, exposed as a webservice, and (at your discretion) integrated with other students' webservices to create a simple crowdfunding site. This site will be designed for a mobile HTML5 target via use of Twitter Bootstrap, will support basic social sharing functions, and will optionally accept Bitcoin for payment.

Lectures will continue in the second part of the course, but will be focused on the design, marketing, and logistical aspects of operating your crowdfunder. Some may decide to spend this time on marketing; others on design; others on making an impressive demo for a crowdfunder video. But all projects will be ranked by (at least) two scalar criteria within each category: the number of Bitcoin raised during the crowdfunder period and/or the number of social media shares of the crowdfunder project (see [slides](#) for details). No other homework will be given in the second half to allow you to fully focus on your crowdfunding project.

Grading will be based on multiple choice questions and programming assignments; as noted above, in the programming assignments you will successively build up portions of your own simple crowdfunding site. The best final projects in each category (e.g. genomics, transportation, law, Bitcoin, etc.) will qualify for prizes sponsored by startups. All homework assignments should be submitted on this site and will be automatically graded.

Background

Familiarity with basic programming concepts at the level of Stanford's [CS106B](#) is required, and some exposure to HTML, CSS, and Javascript will also be helpful. To get a sense of the energy humming through Silicon Valley, the following reading is also highly recommended:

- First, for the big picture see [The Rise and Fall of Personal Computing](#), [Internet Trends](#), and [Why](#)

- [Software is Eating the World](#) (click [online.wsj.com](#) from [Google search results](#) to get past the pay wall).
- Next, look at these articles on [Stanford's Facebook class](#), [The Social Network](#), and [Massively Collaborative Mathematics](#).
 - Finally, read [Startup = Growth](#) and as much of the [CS183 notes](#) as you can.

Here's the [Stanford Bulletin](#) description for the previous, on-campus offering of the class:

Spiritual sequel to Peter Thiel's [CS183](#) course on startups. Bridges the gap between academic computer science and production software engineering. Fast-paced introduction to key tools and techniques (command line, dotfiles, text editor, distributed version control, debugging, testing, documentation, reading code, deployments), featuring guest appearances by senior engineers from successful startups and large-scale academic projects. Over the course of the class, students will build a command line application, expose it as a web service, and then link other students' applications and services together to build an HTML5 mobile app. General principles are illustrated through modern Javascript and the latest web technologies, including Node, Backbone, Coffeescript, Bootstrap, Git, and Github. Prerequisites: Basic computer science as per [CS106B](#). Recommended: some familiarity with HTML, CSS, and Javascript.

FAQ

- **Q: How difficult is the grading in this course?**

A: We will cover a lot of ground, but the goal is for everyone to learn. The class is graded on an absolute scale - in theory it will be possible for everyone to get 0% or 100% of the questions right. The multiple choice questions and programming assignments are amenable to objective grading. Your relative rank in the final project competition will not count towards your grade, but will be useful for gaining recognition from Silicon Valley, including job offers. That said, ultimately a course like this is not about the grade but about what you learn from doing the interactive assignments and the final project. Put in extra effort into the final project and discussion forums to get the most out of it.

- **Q: Regarding the final project, is it an individual or group project?**

A: Please see the [logistics slides](#) for more details. In short, it will be much easier to grade if it is an individual project. We will consider teams if each individual team member submits their own homework assignments and graded portions individually over the course of the quarter, and only team up to promote the ranked final project. We reserve the right to change our minds as the Coursera platform is not geared for grading dynamic student teams!

About Us

Balaji S. Srinivasan (balajis)

Balaji S. Srinivasan is the co-founder of [Counsyl](#), a genomics startup that began in a [Stanford dorm room](#) and now tests more than 2.5% of all US births. Counsyl won the Wall Street Journal's [Innovation Award for Medicine](#), was named one of Scientific American's [Top 10 World Changing Ideas](#), raised more than [\\$65M in funding](#) from Peter Thiel's Founders Fund (among others), and has become one of the largest clinical genome centers in the world. Prior to co-founding Counsyl, Dr. Srinivasan taught data mining, statistics, and computational biology in the Department of Statistics at Stanford University. He holds a BS, MS, and PhD in Electrical Engineering and an MS in Chemical Engineering from Stanford. He was an NDSEG, NSF, and VIGRE fellow and has been published in the New England Journal of Medicine, Nature Biotechnology, and Nature Reviews Genetics.

Vijay S. Pande (pande)

[Vijay S. Pande](#) is a professor of chemistry, structural biology, and computer science (by courtesy) at Stanford University, the director of Stanford's Biophysics Program, and the founder of Folding@Home. [Folding@Home](#) is one of the world's largest distributed computing projects, in which volunteered computers and PlayStations perform simulations of protein folding and computational drug design for disease research. Dr. Pande's [research group](#) has used Folding@Home to break fundamental barriers in the simulation of kinetics and thermodynamics of proteins and nucleic acids. His current work includes novel simulation methods for high-precision drug binding affinity calculations, protein design, and synthetic bio-mimetic polymers.

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