PUCSD Level Up

An alumni attempt to provide needed support to current students.

# Understanding the situation

## Empathy Map

|  |  |  |  |
| --- | --- | --- | --- |
| **What do they believe in** | **What are they saying** | **What are they doing** | **What are they feeling** |
|  |  |  |  |
| Landing in a job is most important | "We need direction" | Asking for mentorship | Disappointed by herself |
|  |  |  |  |
| CS gets money | "I am hesitant to ask questions in English" |  |  |
|  |  |  |  |
| There are opportunities for innovation in CS | "How can I explain to someone that I am right" |  |  |
|  |  |  |  |
|  | "I like solving problems, using my brain, doing something innovative" | The AV room can project screen content with Audio, but interactive sessions will require an audio / mike system, which is not present. |  |

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## Observations from Student Survey

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| --- | --- | --- | --- |
| I created a google form and asked the PUCSD students to fill. Only 19 students filled the form. | | | |
| <https://forms.gle/PPUp9BAVpwbEH2sJ7> | |  |  |
|  | **Observations** | **Possible conclusion** |  |
| 1 | Out of all students only 19 replied. | It is hard to convince students to do anything, so we will need to assume that in any initiative the participation will be small to start with. We will have to either throw carrots or have friends convince friends to come. |  |
|  |  |  |  |
| 2 | 13/19 are not local students, 6 are local | May be local students are not even making effort to fill the form. Some local students are not spending lot of time in department and thus not receptive to things like these requests. |  |
|  |  |  |  |
| 3 | Most students like problem solving, would like to do innovation, like Math. 2 / 19 landed because this was the only department available. | They would love some problem solving challenges. Majority will be interested, but don't expect 100%. |  |
|  |  |  |  |
| 4 | Almost everyone had medium of education in Bachelors in English. 1/19 chose marathi, but his communication is ok, he reads english books. | Medium of communication as English is not an issue for videos, tutorials, Q&A sessions, text books. |  |
|  |  |  |  |
| 5 | Some have really poor writing and most likely speaking english, but there is motivation because they are from very poor families. | Need some cheerleading for these students who are really interested in improving communication, by providing safe environments to practice. |  |
|  |  |  |  |
| 6 | There is less help from seniors or other classmates when it comes to working on assignments. | Need to bring some incentives for seniors to help juniors. |  |
|  |  |  |  |
| 7 | Most online tutorials done by students are for interview prep only. | There is hardly anytime left after working on subject assignments, so students are only doing online tutorials when super critical, like interviews. We will need to weave in long term projects as electives built into the course. |  |
|  |  |  |  |
| 8 | Buring questions | a) What type of work does companies do? |  |
|  |  | b) How to land in a good job / internship? |  |
|  |  | c) In CS, we have multiple domains, how to decide which one to choose? |  |
|  |  | d) Do I need to move out of India? |  |
|  |  | e) Why people think that if u are not placed in any company then you are not doing anything in academic year? |  |
|  |  | f) What's the purpose of human existence?, Can we ever imitate human brain with AI, that way can we live forever? |  |
|  |  | g) Though I am studying os but it's still so difficult to see it as a whole picture and it is hard to connect all dots. |  |
|  |  | h) I think in master degree ,need only one specialization subjects means result like you complete master degree with specialization (sub name) . |  |
|  |  | 1)How things work and how people thought about implemting something? 2)Advancement is good but till what level? 3)How secure is our data even after data encryption and privacy? |  |
|  |  | j) Is CS only for people whoes mind work very fast? |  |
|  |  |  |  |

# 

## Krishnan’s observations

The overall quality is impacted by the following aspects:

a. **Lack of good quality permanent faculty** who can teach the fundamentals of all the subjects: Over the last 20 years since we passed out the department has had multiple HODs from non-CS backgrounds. They have been struggling to find permanent teachers for even the core courses. While it is ok for folks from the industry to take a few lectures/electives it cannot substitute the benefits of a group of good quality permanent faculty with solid experience in CS education and the ability to really teach a student. In this situation, I cannot imagine how the fundamentals can be taught to the students in the same way it was taught to us 20 years back. The fact that the department is requesting for someone from alumni who can be a HOD shows the sad state of affairs. While all of us may have done well/excelled in our careers in the industry over the last 20+ years, honestly I don't think any us (those who have spent time in the industry) come anywhere close to having what it takes to be the HOD of PUCSD. Being a HOD is not just about having solid technical knowledge but excellent teaching skills that only comes with years of teaching and interacting with students of all kinds.

b. **Quality of students being selected**: The selection approach is not merit-based but based on quotas/reservations. So it is highly likley that most of the the students we are dealing may not be interested in CS and have opted for this course just to get a job. While getting a job is not a bad goal to have, it is important to have a basic interest in any subject in which you want to make a career. During my stay in Pune, I made a few hiring trips to the department but I came back really disappointed.

c. **Rigour through which the students are put through**: Compared to when we were studying 20+ years back, the IT industry has changed a lot. The expectations are very different now. The internet has democratised CS education leading to a large supply of people, who have no formal education in CS, but yet are experts on a wide variety of CS topics. And yet in our department, I was amazed to learn from one of the faculty that in our department before any test is given, the teachers are expected to provide a model question paper along with a model answer paper. If this is the level of rigour our students are put through, how can you expect them to compete with the outside world ?

## Current subjects taught in PUCSD

\*\*Please note this is a subset, I got it from one of the student’s resume\*\*

1. Artificial Intelligence,
2. Operational Research,
3. Software Development Concurrent Programming,
4. Formal Methods,
5. Quantum Computing,
6. Abstract Data Techniques Data Structures,
7. Computer Networking,
8. Algorithms,
9. System Programming,
10. Operating System,
11. Theoretical Computer Science
12. PUGOFER,
13. Computer Organisations,
14. Database Management Sytem,
15. Numerical Methods

# Problems - what we see?

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| --- | --- | --- |
| **PROBLEM** | **DETAILS** | **CHALLENGES** |
|  |  |  |
| Modi Sir: How to inculcate continuous learning? |  |  |
|  |  |  |
| Anuradha : Collab and debugging without spending nights in department |  |  |
|  |  |  |
| Finding jobs for the students? | Improving branding so that more companies come to campus |  |
|  |  |  |
| How to bring the level up of the department? |  |  |
|  |  |  |
| Improving communication |  |  |
|  |  |  |
| Provide them with industry relevant problems |  |  |
|  |  |  |
| Improve confidence, motivation level |  |  |
|  |  |  |
| Improve the quality of teaching | Fundamentals are being taught in the same way as we were taught | May be too intrusive |
|  |  |  |
| How to setup a funding pipeline |  |  |

# The problem that we want to focus on

1. How do we prepare the students to get them into internships and jobs?
   1. Communication classes
   2. Technical talks
   3. Mentoring - Tried, Good results
   4. Awards and Carrots to keep them motivated
   5. Industry relevant talks
   6. Hackathons

# Recommendations

## HVS : Make short videos on why fundamentals are important.

* Learning Fundamentals is important
* Answer burning questions
* Industry trends
* Memory lane by alumni

## SKM : Sponsor some projects to motivate students

* Robotics
* AI - Machine Learning
* System Design
* Graphics Modelling

## Archana : Start monthly Alumni Day

* Share couple of videos / Alumni talk about their stories
* Remote seminars - Technical / non-technical
* Do Q & A with students
* Let students demo their project / assignments / speak
* Focus on a specific course and do a Q&A for keeping motivation
* Award student of the month
* Focus on a specific course and do a Q&A for keeping
* Dinner should be served

## Ram and (Nitin Patil) : Find a passionate HOD

## Krishan : Mentor program - One alumni takes 5 students

## Krishnan :

### **Getting good quality permanent faculty for the department**

Discuss with department and University to find out the challenges involved in attracting good quality permanent faculty for the department. This would require some high level connections but given our vast alumni network, we should at least try and find someone who can connect with Pune University at the highest level. **Difficulty level: Very High**

### **Curated online lectures**

While the internet is full of high quality material on CS topics, it can be quite overwhelming for someone who is new to CS. I propose that we create a set of curated online lecture material for all the core courses that are being taught now at PUCSD. Given that most of the top CS institutions across the world are making high quality lectures available for free, I don't think this should be difficult. If the detailed course syllabus is made available to us, we could systematically create a curated set of lectures for each of the core courses. To ensure that the students actually go through the curated set of lectures, we could have assignments/problems linked to the lectures with some prizes. **Difficulty level: Moderate**

### **Increasing the rigour**

Talk to department faculty about the current expectations from the industry and the need to put students through more rigour - surprise tests, challenging problems. Need to stop giving tests with model question papers/answers. It is better for students to know where they stand during the course than face a rude shock during placement time. I am sure we all agree that the tough times we faced in the department prepared us well for the outside world. **Difficulty level: High**

### **"Paper" programming**

With the advent of laptops and internet the ability to craft or design a program on paper is all but lost. To bring back the focus on programming, I propose a monthly programming contest. Note that this is not a hackathon. The idea is as follows: 1. At a designated time, student accesses a link 2. The student is shown the programming problem 3. The student is locked into a full-screen area for writing the program. At this stage nothing else on the computer can be accessed. 4. Once the time runs out the answers are automatically submitted. 5. The best submission will be awarded a prize. Goal here is to encourage the habit of writing a program on paper without any IDE or access to existing code to copy from. **Difficulty level: Easy**

## Kiran :

### Keep alumni excited and engaged to contribute

* we would gather locally - Say Delhi/Bangalore/Hyderabad/Pune/Bay area/East coast regions. global sync up quarterly over teleconference.
  + Topics: funds, programs, volunteer (to help improve soft skills)

### New programs for the students

* Hackathons - yes to them, code sprints of various kinds - once a semester
* Internship Projects (we should set up a plan to pay student internship money to keep them interested).
  + Perhaps a large scale in-house initiative - that grows every year and we are able to publish and market this product
* Build research culture - introduce new topics. Exposure to academic conferences. Critical thinking - analyze published papers.
* Experience sharing - have alumni talk about career roadmaps - possibilities and opportunities
* Engage with teachers to see how we can help in tutoring or even curriculum improvements, industry relevant assignments etc
* Make Nostalgix a bigger event. Every year a few alumni commit to attend Nostalgix. and a day before this event - we host workshops and student engagement
* How about a periodical or magazine (whatever frequency). This way we can not only provide links to monthly video but can cover different topics. have articles from Alumni, programming challenges or other comp-science contests, algorithmic insights, history about (PUCSD, alumni, teachers) and fun section, and what not! We could do both electronic and paper format.

# Experiments we want to run

TBD

# Logistics

TBD

Raw notes

1. Stating the problem and common understanding of the problem - IMPORTANT
2. Prioritize the efforts
3. Execution - The easy part and