"InternBit" for Automated Discovery of Relevant Internship Opportunities based on RadGrad User Data

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Contents

1   Introduction

Searching for internships as a student is a time consuming process that requires a lot of effort. My project aims to lower the "activation energy" for a student to get started and be successful in their internship search. Internships are not only hard to look for, obtaining the right skills required to qualify for one can also be daunting. Sometimes technologies and languages might be listed in a job description that a student has never heard of before! Sometimes students don't know what they don't know. As in, they don't know what they need to know to qualify for an internship, and they might not know where to go to learn those things. To add more to the confusion, there are many different sources to check and comb through for an interesting and relevant listing. On Oahu, many employers search for local students to fill their openings by contacting the college department advisor or local ACM chapter president. From there, their messages are announced and forwarded to the whole student mailing list. This may attract a lot of students, but it has the downfall of being very un-targeted. While RadGrad is a great resource, it is not updated frequently and unfortunately students might not think of it as the first place to go when searching for career guidance. While students do gain knowledge from classes, being able to articulate what you learned is a different story. For example, while a student might have learned a new language, Python, they might not add on their resume that their Python class involved natural language processing. It is not only the technologies you know, but also the processes and responsibilities you use it for. Some students also struggle to figure out right classes, events, and clubs to join in order to further achieve their goal of landing a certain internship.

2   Related Work

While there are a wealth of internship searching websites and databases on the internet, InternBit is tailored to streamline the process for undergraduates by collaborating with universities.

2.1   Student Opportunity Center

The Student Opportunity Center is resource that claims to be the "nation's largest database of internship, volunteering, study abroad, research, events... and more". They are have 150+ campuses, 4000+ partners, and 300k+ students in their system.

Welcome to Student Opportunity Center

Start searching through the nation's largest database of internship, volunteering, study abroad, research, funding, events, and more.
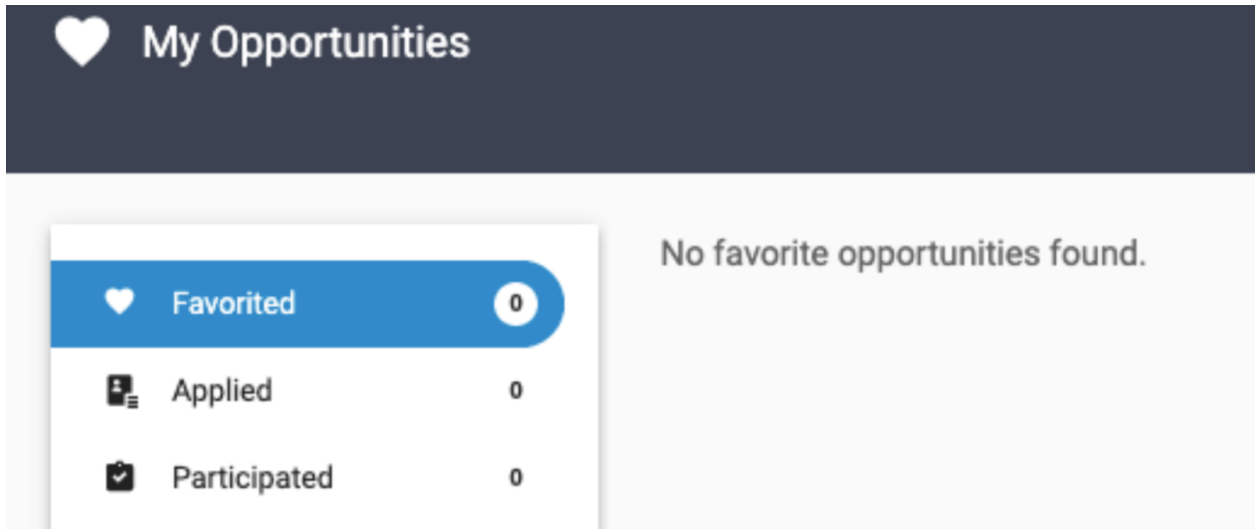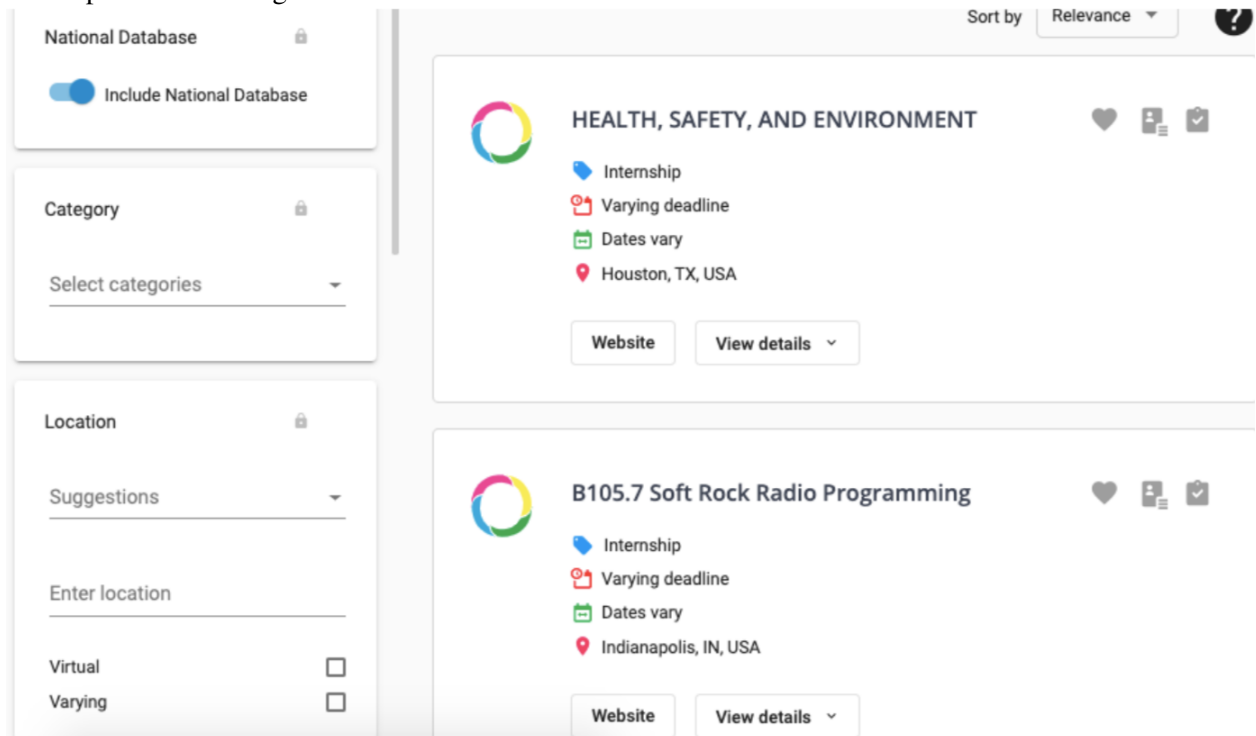
Q Get Started Looking For Opportunities!

On the homepage of SOC, there is a map that shows local opportunities.

On the interests page, the interests are very broad and are mostly just titles of majors, not really specific subfields inside each domain. For example, the only computer science related majors are the ones I favorited on the left panel in the image.

The SOC claims to track "every stage" of participation of an opportunity. In this page, it shows it tracks when you favorite, apply to, and participate in an opportunity. Each listing on the explore page shows the deadline, dates, location, and category of the opportunity. The panel on the side lets you filter by deadline, date, location, and category.They have different deadline types: seasonal, rolling, and varying. The explorer can be sorted by relevance, deadline.

LZ Technology Inc Student

🏷️ Internship

📅 Varying deadline

📅 Dates vary

📍 Houston, TX, USA

Description

Students must be pursuing a 4-year degree in the STEM disciplines (Science, Technology, Engineering and Math).

Students work as paid interns in the aerospace industry

Projects include work in the support of the Johnson Space Center and the International Space Station

Students get the chance to work alongside aerospace engineers, project managers and staff

Not only is this a great professional opportunity it is a paid internship!

Citizenship Required

No

engineering   mathematics   technology

Website   Hide details ^

2.2 LinkedIn

LinkedIn is a social network, messaging tool, job board, and has company reviews. As a computer science student looking for internships, LinkedIn helps me find jobs at companies where I have mutual connections from the same college or past companies. This helps me recognize those job opportunities and a way to contact them about career advice either through reviewing my online resume, LinkedIn profile, portfolio, interview preparation, and a recommendation. LinkedIn does a great job of putting all of these features in one place. LinkedIn also matches you to relevant job opportunities based on my relevant skill sets, interests, industry, and location. You can be discovered by recruiters through your online profile that acts like a resume on LinkedIn.

How you match ⊘

Criteria provided by job poster

Skills

- ✓ Analytical Skills
- ✓ Computer Science
- ✓ Engineering
- ✓ Problem Solving
- ⊘ Computer Engineering

- ⊘ Work Processes
- ⊘ Administration
- ⊘ Operations
- ⊘ Air Force
- ⊘ Impact Assessment

Level of education

- ✓ Bachelor's Degree

Highlights

2 people at Air Force Civilian Service also studied at University of Hawaii at Manoa

Some listings show already how many skills match your profile and it also shows how many people already applied. You can see how many Connections you have related to the listing as well.

Computer Science Intern

Parsons Corporation · Portland, OR, US

Posted 1 month ago · 481 views

Save **Apply**

See how you compare to 123 applicants.
Try Premium Free for 1 Month

Job	Company	Connections
• 123 applicants	• 10001+ employees	8 alumni
• Internship	• Information Technology & Se...	

2.3   GlassDoor

Glassdoor also has a search feature, but their primary focus is their reviews from their past and current employees as well as their salaries/employee benefits. The reviews give a valuable insight to the lifestyle and culture of the company including working life, supervisors, interactions in the office, potential to move up and overall job satisfaction. Glassdoor also helps me compare salaries so I can compare offers and have a starting point when asked for a requested salary for a position.

Trusaic   4.2 ★

Technical Product Associate Intern (2020 Summer Internship)

Los Angeles, CA

⚡ **Easy Apply**   ♡ **Save**   •••

Actively Hiring   Trusaic is actively hiring for this role. Apply now!

Job   Company   **Rating**   Salary   Reviews   Why Work With Us

Trusaic Ratings

4.2 ★★★★☆
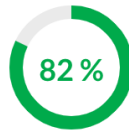
82 % Recommend to a friend   **83 %** Approve of CEO   Robert Sheen, Esq.
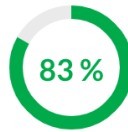
29 Ratings

Ratings and Trends

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Other Salaries at Trusaic   Updated Dec 24, 2019

Job Title	Average Base Salary (USD)	Low	High
Account Executive 1 Employee Salary or Estimate	About **$57K - $63K**	$57K	$63K
Operations 1 Employee Salary or Estimate	About **$58K - $63K**	$58K	$63K
Executive 1 Employee Salary or Estimate	About **$152K - $166K**	$152K	$166K

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2.4 Chegg Internships

Chegg Internships has a decently sized database of internships. The website also has a blog for general advice and tips for landing internships and advancing your career. The website presents the search results in a tiled grid, and they also have email alerts you can sign up for. There is nothing that special other than the fact it focuses only on internships.

GETTING THIS POSITION

Learn how to get your resume noticed and nail that interview.

Your Internship Checklist

① **Build a better resume**
98% of candidates are eliminated at the initial resume screening.

Learn how to be in the 2% ❯

② **Apply early and often**
Apply early and apply often - the first 8 days of a job posting matter most.

Tips for the application process ❯

③ **Prepare for the big interview**
Do your research and practice your responses to make a lasting impression.

How to ace your interview ❯

Was this helpful? 👍 👎

2.5 WayUp

WayUp is another job search website that includes messaging and also another blog about career advice. Similar to LinkedIn, you can create a profile where you fill out your skills, work history, and preferences that acts like an online resume where recruiters can discover you and message you. The database is much smaller compared to the other job board sites, and most of the postings are from the company SAP.

Wells Fargo
Chandler, AZ

2020 Wells Fargo Technology Internship Program (Chandler, AZ)

Responsibilities:

At Wells Fargo, we want to satisfy our customers' financial needs and help them succeed financially. We're looking for talented people who will put our customers at the center of everything we do. Join our diverse and inclusive team where you'll feel valued and inspired to contribute your unique skills and experience. Help us build a better Wells Fargo. It all begins with outstanding talent. It all begins with you.

Wells Fargo & Company (NYSE: WFC) is a diversified, community-based financial services company. Founded in 1852 and headquartered in San Francisco, Wells Fargo provides banking, insurance, investments, mortgage, and consumer and commercial finance through our many locations, ATMs, the internet (wellsfargo.com) and mobile banking.

Wells Fargo Technology sets IT strategy; enhances the design, development, and operations of our systems; optimizes the Wells Fargo infrastructure footprint; provides information security; and enables continuous banking access through in-store, online, ATM, and other channels to Wells Fargo's more than 70 million global customers.

The mission of Wells Fargo Technology is to deliver stable, secure, scalable, and innovative services at speeds that delight and satisfy our customers and unleash the skills potential of our team members. Technology is a critical enabler for Wells Fargo, and establishing a strong performing technology organization is a strategic imperative for the company.

Please upload the most recent version of your resume. *

📎 **Drag & drop or click here**
to upload your file (.doc, .docx or .pdf and 10MB max)

You have a resume on file that was added on January 2020. Click here to update resume.

Is your profile up to date?
Employers will see this when you hit apply.

Save   Next

2.6   Indeed

indeed   Find jobs   Company reviews   Find salaries   Upload your resume   Sign in

What computer science   Where Los Angeles, CA   Find jobs   Advanced Job Search

Remote   Date Posted ▾   within 25 miles ▾   Salary ▾   Internship ✕   Location ▾   Company ▾   Experience Level ▾

Upload your resume - Let employers find you

computer science jobs in Los Angeles, CA

Sort by: relevance - date   Page 1 of 9 jobs ⓘ

Dow Student Engagement Event - Internship Opportunities
Dow 4.0 ★
United States

○ Applicants must be currently pursuing a bachelor's degree with an anticipated graduation date by December, 2022.
○ Management of Information Systems(MIS).

27 days ago • Save job

Fullstack Software Developer Intern (JavaScript, Swift)
GoGoody Inc
California • Remote work available

$15 - $25 an hour

Dow Student Engagement Event - Internship Opportunities
Dow ★★★★☆ 1,672 reviews - United States
Internship

Apply On Company Site   ♡

The Dow Chemical Company invites outstanding students interested in a career in Supply Chain, Engineering, Information Systems, Marketing, Accounting/Finance, Public Affairs, Human Resources to apply by May 31, 2020 for participation in a conference sponsored by The Dow Chemical Company and aimed at applicants from underrepresented minority groups and/or disability students in the United States

_ DIAMOND SYMPOSIUM_
Dow
August 3 - 5, 2020
Midland, Michigan

Applicants must be currently pursuing a bachelor's degree with an anticipated graduation date by December, 2022.
Degree disciplines that will be considered:

• Logistics/Transportation
• Supply Chain Management

Indeed is the biggest database for job and internship searching compared to LinkedIn, Glassdoor, and WayUp. There is also a messaging system and public profile but I haven't ever got messaged on Indeed. Instead, I've been messaged on LinkedIn and WayUp before.

Front-End / UI Developer (Mandarin MUST - Will Train - Nationwide)

Software.Enterprises - Los Angeles, CA

$60,000 - $75,000 a year - Full-time, Internship

Apply Now   ♡

government for both permanent and contract C2C staffing arrangements. Our recent placements include Apple, Google, Facebook, JPMC, Wells Fargo and several other fortune 500 companies.

Knowledge and Skills:

- Exposed to and/or experienced with several technologies such as: React JS, SASS, JSON, AJAX and Bootstrap
- Provided solid markup skills in utilizing HTML5, CSS3, JavaScript, and jQuery
- Developed front-end skills and some basic understanding of how back-end development works
- Knowledge of designing mark up, developing the UI of websites and/or web applications
- Demonstrated understanding of UX and UI design with an emphasis on maximizing usability
- Knowledge of using REST web services and working with interface design
- Desired to work in a collaborative, innovative, flexible and agile JavaScript Development team-oriented environment
- **Fluent in Mandarin** (Mainland).

Education and Qualities:

Shot 2020-05-13 at 1.21.29 PM.png

Indeed has an API we can use to fetch jobs from their website.

2.7 Summary Table

Online Job Boards vs InternBit	LinkedIn	GlassDoor	Chegg	Wayup	Indeed	USAJobs	SOC	NSF	InternBit
Social Network & Peer Activity	✖	◐	○	○	○	○	○	○	◐
Company Reviews & Salary Insights	✖	✖	○	○	◐	○	○	○	○
"Verified" Skills	✖	○	○	○	○	○	◐	○	◐
Job / Search Alerts	✖	✖	✖	✖	✖	✖	○	○	✖
Personalized Recommendations	✖	✖	✖	✖	✖	○	◐	○	✖
Easy Apply: Profile = Application	✖	◐	○	○	◐	✖	○	○	○
Profile / Resume Visible to Employers	✖	✖	✖	✖	✖	✖	✖	○	◐
Undergrad / Intern focused	◐	◐	✖	✖	◐	◐	✖	✖	✖
Message Recruiters	✖	○	✖	✖	✖	○	○	○	○
Map View	◐	○	○	○	○	○	✖	○	○
Career Advice / Blog	◐	◐	◐	○	○	○	○	○	◐
Exlusive Listings Only found here	○	○	○	○	◐	✖	○	◐	✖
Report back to Employers	✖	✖	✖	✖	✖	✖	○	○	○
Report back to School Institution	○	○	○	○	○	○	✖	✖	✖
"Track" Application Stages	✖	✖	✖	✖	✖	✖	✖	○	✖
Structured Listings	◐	○	◐	○	○	✖	◐	◐	◐

2.8 InternBit: Table Explanation

Social Network Peer Activity: The main competition is LinkedIn. It can be implemented by creating an opt-in feature because of legal restrictions on sharing student data.

Company Reviews Salary Insights: The main competition is LinkedIn and GlassDoor. I will not be implementing this in InternBit.

Verified Skills: The main competition is LinkedIn. This will be implemented by checking the skills from

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the classes taken in STAR. Additionally, students can link to their Techfolio.

Job / Search Alerts: Most competing websites have this. This is not essential but would be nice to be implemented. It can come in the form of an weekly email as jobs could be scraped weekly.

Personalized Recommendations: Most competing websites have this. This is an essential feature for InternBit based on the student's profile.

Easy Apply: Most competing websites have this, that is because the companies post directly to the website or they are partnered with them. This can somewhat be implemented in InternBit for local companies that want to post listings for UH Students, but for the most part, InternBit will just link out to the application on the company website.

Profile / Resume Visible to Employers; Most competing websites have this. Because of legal reasons, InternBit cannot fully implement this. This could be an opt-in feature that the student agrees to for local companies wanting to discover them.

Undergrad / Intern focused: Most competing websites have this. This is an essential feature for Intern-Bit.

Message Recruiters: A few competing websites have this feature. This is not essential for InternBit and will not be the focus as it is a huge feature to implement.

Map View: The main competition is the Student Opportunity Center. This is not an essential feature, specific locations of listings are hard to find and are usually not provided.

Career Advice / Blog: Most competing websites have this. This is not an essential feature for InternBit, as the focus will be on searching and personalized recommendations. However, InternBit can refer students to Opportunities in RadGrad to learn skills they are lacking.

Report back to Employers: Most competing websites have this. This will not be implemented because of legal reasons, unless something can be worked out to report to local companies.

Report back to School Institution: Most websites do not do this. Since InternBit will be partnered with UH, we can report back statistics for students such as how many listings on average does a student match with, or how many and which skills are lacking.

Track Application Stages: Most websites do this. InternBit plans to track the following stages: Favorited, Applied, Accepted.

Structured Listings: Most websites do not have structured listings except for some on LinkedIn and USAJobs. Most of the time it is just a big body of text in the description and it is structured according to how each company writes listings, so it varies. NLP can be used to determine keywords and the structure of the listing during extraction and scraping.

3   Parser Implications

I plan to only parse the following websites: NSFREU, USAJobs, Chegg, and Indeed. The first two have listings only found on their website, and the next two have sufficiently large databases. If I were to scrape all of the websites there would be too much overlap to check the database if a listing has been double posted. Out of LinkedIn, GlassDoor, Wayup, and Indeed, Indeed has the biggest database. LinkedIn has a no scraping policy in their Terms of Use. Indeed has a Job Search API that we can access if we apply for a free Publisher account I plan to scrape Chegg by just making requests that return a JSON of all the results.

4   Research Questions

My project aims to answer the following questions:
- Can InternBit provide a resource for the internship search process that students prefer over their current search process?

- Can InternBit lower the time required for students to search for internships, and create a higher success rate for students seeking internships?

- Will RadGrad users spend more time in the application, now that specifying their Interests, Career Goals, and Degree Plan will improve the capabilities of InternBit?

- Does the ICS Department provide students with sufficient preparation to obtain the internships they desire?

- Can historical data involving i-Internship be used to correlate opportunities with future success in gaining internships?

If a central job and internship recommendation and search system was created for ICS Students to find local and mainland opportunities, then the students will have a higher success rate with searching and applying for internships.

5 User Requirements Analysis

In order to understand the current problems the students face, and where each problem comes from, I propose to ask the following questions to students who have already favorited internship opportunities in the RadGrad system and students who have expressed interest to their Advisor. (Click me: Google Form)

6 High Level Goals

I plan to design a system that will achieve the following goals: increase overall RadGrad engagement, become a central and one of the first places to turn to when a student needs to look for internships, aid advisor workload, and quicken the search process for a matching internship.

7 System Overview

In order for my system to be highly effective, a student would need to input accurately all of their skills and where they learned it from during the onboarding process.

The system will be a central database that aggregates data from multiple sources to make the searching process more streamlined and simpler. It will do this by scraping SECE, various job board websites, and creating a system for local employers to email RadGrad instead of the advisor or ACM Manoa. Alternatively, there can be a "portal" (or a Google Form) for local employers to request to post jobs for our students only. Ideally, RadGrad is the first source that 3rd parties should contact to announce and notify students of their opportunities.

In order to have better recommendations and match students with their previous experience, the list of ICS Classes that is imported will additionally be added "Skill" values that the student can edit and update. Since student opportunities also count as previous experience, the opportunities that a student has done will also be added "Skill" values. The student could have a "Profile" page that allows them to update their skills, interests, career goals. This page would allow them to view how different experiences (classes & opportunities) contributed to the skills they know. *This profile page could also show them the progress they are at to fulfilling all the skills required for one of their career goals they selected.*
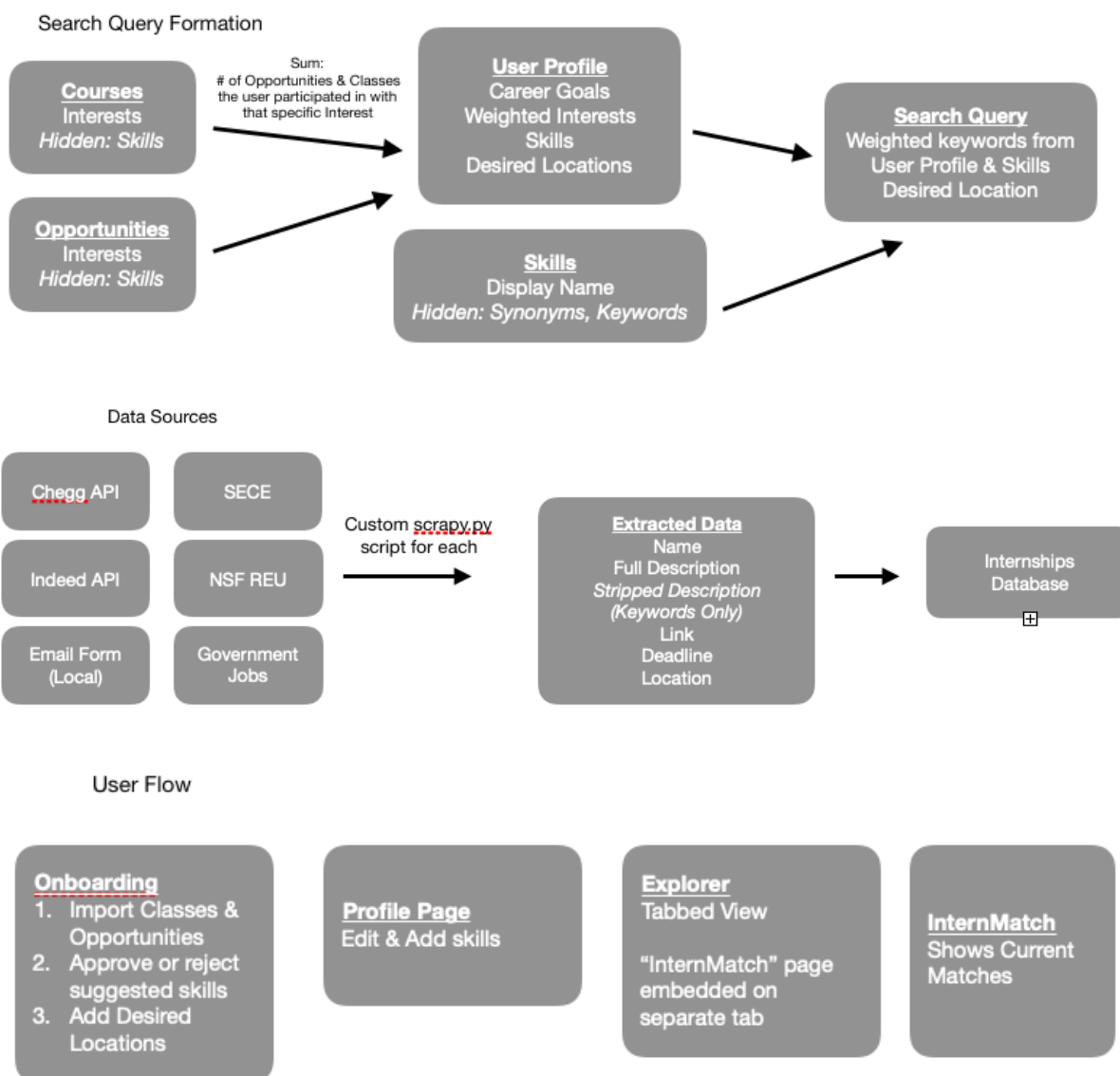
Ideally, the system would be embedded into RadGrad that operates independently as a 3rd party service. Requests sent to the system will include information about the student's profile, and a response will give the list of matching opportunities.
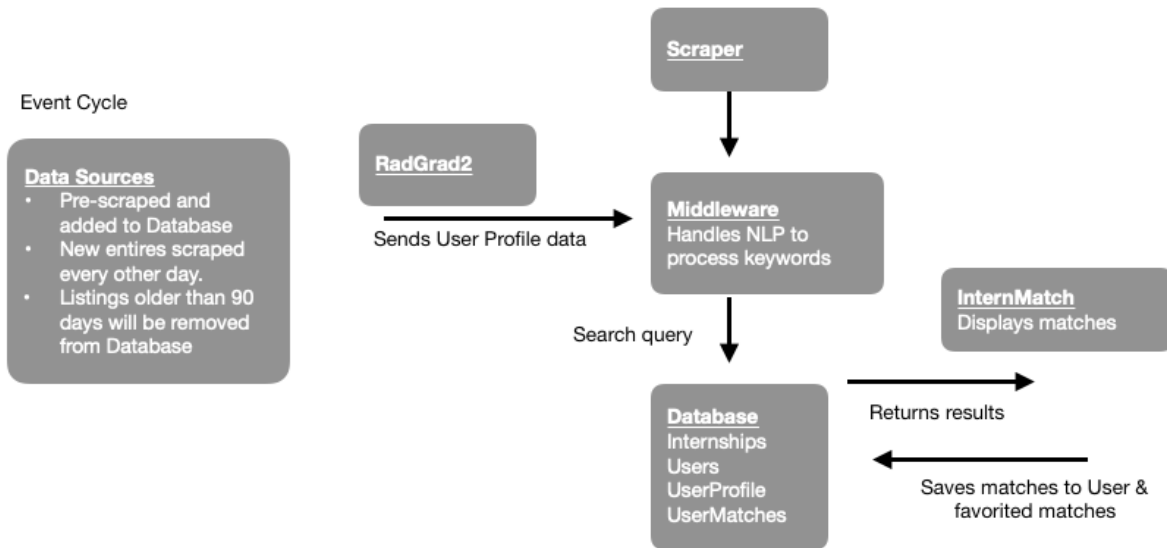
One of my thoughts is that students may not be using RadGrad that much because they might feel it is not updated often. For example, they think it is something to check every semester of so. Another reason they might turn to other sources is because it is updated often, such as the ACM Manoa Discord and their Inbox. This can be combated with this new system that regularly updates and keeps track of deadlines.

Since students must verify their opportunities manually by email before it is included in their profile, I feel this might hinder the speed at which new "Skills" gained from these opportunities can be added to a students profile. So, a student's matches might not be completely accurate because they did some opportunities but are still waiting for verification and for those skills to be added.

Instead of receiving multiple emails a day, or needing to check different sources frequently, students can just subscribe to a weekly email that summarizes the most relevant opportunities for them.

8 System Design

Event Cycle

Scraper

Data Sources
- Pre-scraped and added to Database
- New entires scraped every other day.
- Listings older than 90 days will be removed from Database

RadGrad2

Sends User Profile data

Middleware
Handles NLP to process keywords

Search query

InternMatch
Displays matches

Database
Internships
Users
UserProfile
UserMatches

Returns results

Saves matches to User & favorited matches

9 System Implementation

Within the RadGrad2 data model, an extra field called "Skills" will be added to each Course and Opportunity. This field will be hidden in the Courses and Opportunity cards but only be visible to the student on their Profile Page. A "Skills" field will be added to each user as well, and they have the option to add and delete skills as they wish on their page, not affecting the "Skills" field in the courses and opportunities.

I will use the libraries Cherrio.js or Puppeteer.js for scraping the web. For handling the API calls and requests, I will use Express.js. The scraped data will be stored in a MongoDB database. For NLP processing of the keywords from the scraped listing descriptions and also process the student's profile on RadGrad2, I will use Natural.js. Their profile will consist of the classes they took and the opportunities they participated in. Each of these has the Interests and Skills fields, and the Middleware will tally all the instances where a certain Interest and Skill was used, and this will generate the weighted keywords used for searching. Additionally, the defined list of skills will have an additional field that defines alternate spellings, synonyms, and related keywords to that skill to be used in the search query. The student will see the InternBit page, which will be embedded into RadGrad2 as a separate tab within the Explore Opportunities page.

10 Evaluation

The useful insights my system hopes to provide is how well the ICS Department prepares students and if our students are actually successful and finding internships. Since we can trace back to where a student learned a particular skill, through a course or an opportunity, we can see if the classes we offer provide the necessary skills for students to qualify for internships. We can also trace back which opportunities and classes have resulted in students obtaining internships. (Click me: Google Form)