DANIEL NASHED

➜ YouTube Demo: https://www.youtube.com/watch?v=PoOluRRR2ug

BIRDIE

THE JOB HUNTING AI AGENT

TABLE OF CONTENTS

PROBLEM STATEMENT

Job hunting is hard.

→ Job sites like LinkedIn and Indeed rely on keyword search and filters which are inflexible.

→ Researching potential future employers is time consuming.

→ Companies use applicant tracking systems (ATS) to scan resumes and extract information, which can filter out candidates whose resumes are not ATS-compliant.

→ Writing cover letters for every application often isn't feasible.

GOALS

➜ Give job hunters a natural language interface for specifying their job preferences and skills

➜ Use LLM agents to automate the manual process of researching companies to learn about their mission, values, and employee sentiment

➜ Tailor resumes to each role to optimize for ATS-based keyword matching

➜ Write cover letters for each company to convey professionalism and personalize job applications

DEMO

My Jobs Dashboard

Flight Schedule Never ▾

Fly Birdie | Ask Birdie... | Ask

Select Date Range: Last Day ▾

| | Total Jobs Found | Relevant Jobs |
| Applications Submitted |

Total Jobs Found 230

Relevant Jobs 42

Applications Submitted 9

Daniel Nashed

Dashboard

User Profile

Jobs

Resumes

Cover Letters

Mailbox

Logout

<

Top 3 Picks This Week | 17th November - 23rd November 2024

Software Engineer Intern, Machine Learning (PhD)

Meta - Sunnyvale, CA

$7,313/month - $11.3K/month

Machine Learning · Python +4

View Tailored Resume | View Tailored Cover Letter | Draft Email | Not Interested | Favorite | Apply

Senior Software Engineer, Maneuver Dominance

Anduril Industries - Boston, MA (On-site)

$168K/yr - $252K/yr

Machine Learning +1 · C++ +1

View Tailored Resume | View Tailored Cover Letter | Draft Email | Not Interested | Favorite | Apply

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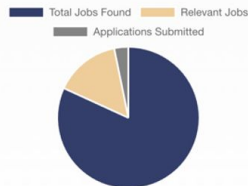
Logout

<

My Jobs Das

Flight Schedule [Never ▾]

Select Date Range: [Last Day ▾]

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[View Tailored Resume] [View Tailored Cover Letter] [Draft Email] [Not Interested] [Favorite]

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hi

Hello! How can I assist you today?

give me 2 sentences on how to write a good resume?

To write a good resume, ensure it is clear and concise by highlighting your key skills and achievements relevant to the position you're applying for, using bullet points for easy readability. Tailor the resume for each job application by incorporating specific keywords from the job description to align your experience and qualifications with the employer's needs.

[Continue conversation...] [Send]

Daniel Nashed

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Birdie Job Hunting Record

Here is a database of all the jobs Birdie hunted for you so far. Jobs marked with 💗 are your favorites, while those marked as ⭐ are Birdie's favorites.
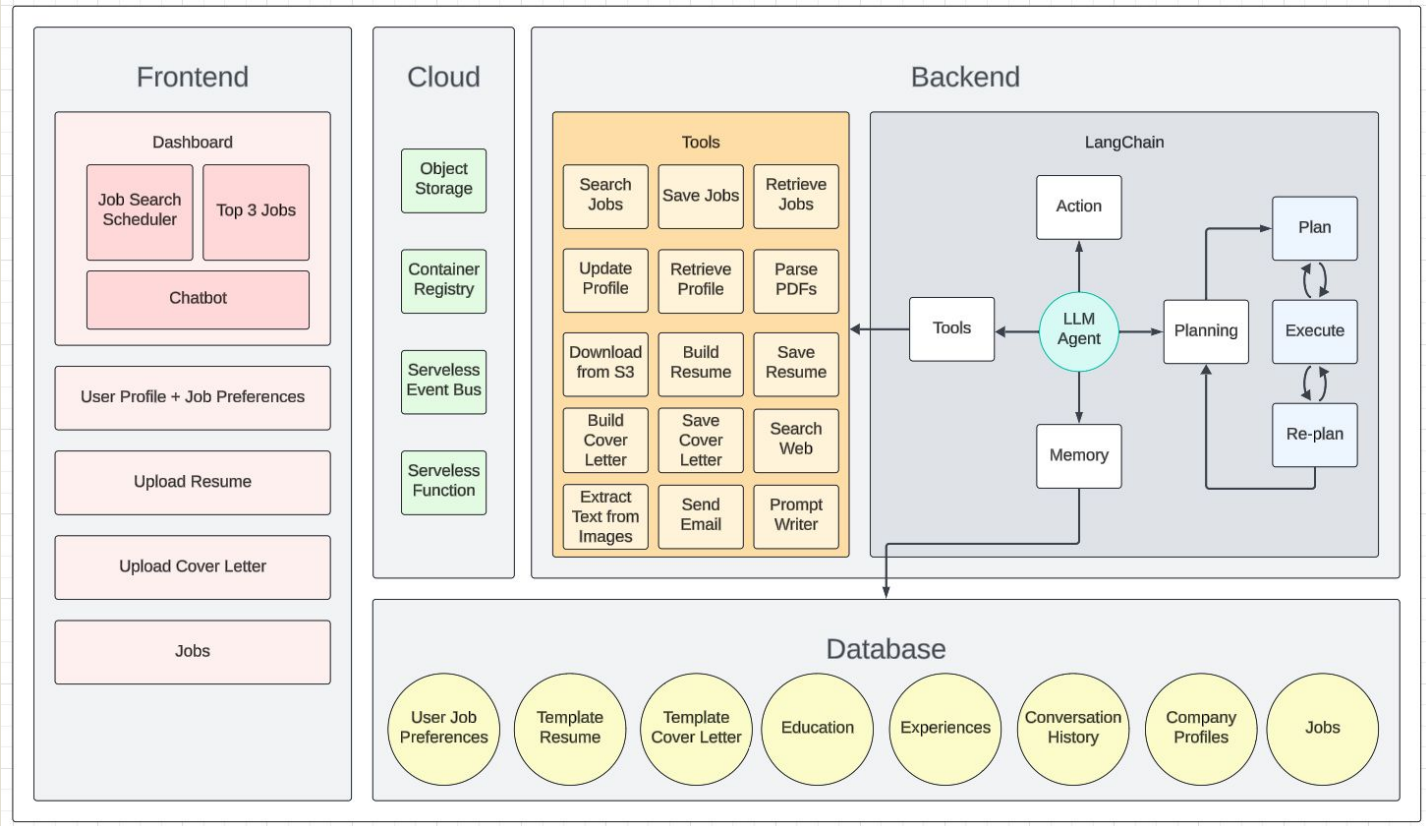
Job Title	Company	Location	Salary	Resume	Cover Letter	Favorite
Part Time Sales Associate	Pigment	Del Mar, CA	$18/hr - $25/hr	Tailored Resume	Tailored Cover Letter	💗
Executive Assistant	Double	United States	$20/hr - $25/hr	Tailored Resume	Tailored Cover Letter	💗⭐
Field Sales and Marketing Representative Intern	Techtronic Industries - TTI	Milwaukee, WI	$18/hr	Tailored Resume	Tailored Cover Letter	💗⭐
Enterprise Events Manager	Nasdaq	New York, United States	$83.1K/yr - $138.5K/yr · 401(k) benefit	Tailored Resume	Tailored Cover Letter	⭐
Software Engineer Intern (Applied Machine Learning-Engine) - 2025 Summer/Fall (PhD)	XxxxXxxxx	San Jose, CA	Missing	Tailored Resume	Tailored Cover Letter	👍
Software Engineer (FIDO2-US) - 2025 Start (BS/MS)	XxxxXxxxx	San Jose, CA	Missing	Tailored Resume	Tailored Cover Letter	⭐
Software Engineer Intern (Applied Machine Learning-Enterprise) - 2025 Summer/Fall (PhD)	XxxxXxxxx	San Jose, CA	Missing	Tailored Resume	Tailored Cover Letter	👍
Software Engineer Graduate (AML-Engine) - 2024 Start (BS/MS)	XxxxXxxxx	Seattle, WA	Missing	Tailored Resume	Tailored Cover Letter	⭐
LLM Software Engineer/Researcher (Applied Machine Learning)- 2024 Start (PhD)	XxxxXxxxx	Seattle, WA	Missing	Tailored Resume	Tailored Cover Letter	⭐

SYSTEM OVERVIEW

OVERVIEW

→   User creates account, enters their job preferences and uploads resume

→   LLM parses resume
- ◆   Extracts all technical skills (e.g. Python, ML, AWS, etc...) & saves to database
- ◆   Extracts education, experiences, projects & saves to database

→   User can set scheduler to fetch jobs on regular basis or on the spot
- ◆   LLM searches web for relevant jobs based on user skills, experiences & preferences
- ◆   LLM ranks jobs and saves to database
- ◆   LLM writes tailored resume + cover letter for top 3 jobs

→   User can view retrieved jobs online, favorite, dislike or apply

→   User can interact with chatbot to search for more jobs, tweak resume/cover letters or ask any job-related questions

SYSTEM DIAGRAM

Frontend

Dashboard

Job Search Scheduler | Top 3 Jobs

Chatbot

User Profile + Job Preferences

Upload Resume

Upload Cover Letter

Jobs

Cloud

Object Storage

Container Registry

Serveless Event Bus

Serveless Function

Backend

Tools

Search Jobs | Save Jobs | Retrieve Jobs

Update Profile | Retrieve Profile | Parse PDFs

Download from S3 | Build Resume | Save Resume

Build Cover Letter | Save Cover Letter | Search Web

Extract Text from Images | Send Email | Prompt Writer

LangChain

Action

Tools

LLM Agent

Memory

Planning

Plan

Execute

Re-plan

Database

User Job Preferences | Template Resume | Template Cover Letter | Education | Experiences | Conversation History | Company Profiles | Jobs

TECH STACK

➔ LLM
- ◆ OpenAI ChatGPT-4o for LLM API calls
- ◆ LangChain for agentic framework

➔ Backend
- ◆ Django for web framework
- ◆ MongoDB for NoSQL database
- ◆ AWS S3 for cloud object storage, Lambda for serverless functions, EventBridge for serverless event bus (event-driven architecture)

➔ Frontend
- ◆ React for Javascript-based frontend library
- ◆ Figma for UI/UX

➔ Other
- ◆ Docker for containerization
- ◆ GitHub for version control
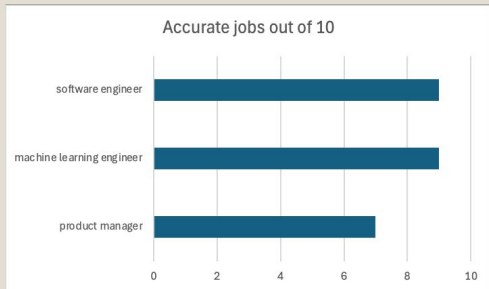- ◆ Daphne for ASGI server (HTTP + WebSocket)

AI Agent Tools

➔ **Search Jobs Boards**
- ◆ TheirStack API aggregates job postings from several sources
- ◆ Translated TheirStack API docs into Pydantic model

➔ **Download & Parse Resume**
- ◆ Download S3 objects (resumes) to local file path
- ◆ PyPDF Library to extract text content from local resume

➔ **CRUD for Profile & Jobs in MongoDB**
- ◆ Get profile tool, update profile tool, get saved jobs tool, save new job tool
- ◆ Tools configured with user ID for current session (prevent cross-user data leakage)

➔ **Generate Resume & Cover Letter**
- ◆ Takes structured resume/cover letter content as input & populates PDF content
- ◆ Uploads generated PDF to S3 & stores URL on the relevant Job in DB

➔ **Search & Scrape Web**
- ◆ Tavily search engine (search results include URLs and content snippets)
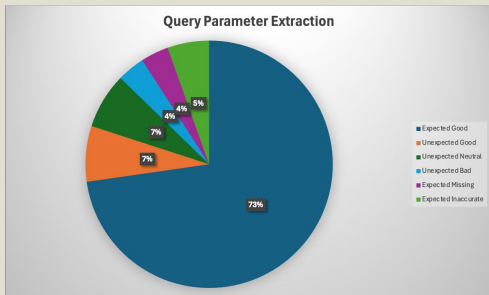- ◆ BeautifulSoup - extract text content from webpage url & truncate content to fit within LLM's context length limit

EVALUATION

METRICS

➔ Number of queries out of 10 that were accurate to the user profile and chat-based criteria.

➔ Out of all the listed job requirements and preferences defined by user, what % was correctly parsed into the API job search query?

FUTURE IMPROVEMENTS

➔ **Find a Cheaper Model**: Transition to an open-source model, such as LLaMA
➔ **User-Agnostic Jobs Database**: Store all job postings in a user-agnostic database to minimize cost of API calls.
➔ **Minimize Context Retention in Chat Sessions**: Use a sliding context window or summarize past exchanges
➔ **ReAct or Plan-and-Execute**: Use the LLM to reason through the job requirements and the user's strengths and generate a plan, then create a tailored resume or cover letter
➔ **Structured Workflow with LangChain**: Create a graph of nodes where the chat node triggers a prompt-building tool, which then feeds into separate resume and cover letter-building tools, ensuring both documents are always generated with a well-crafted prompt before outputting to the chat.
➔ **Long-Term Memory:** Implement long-term memory to save insights from chats, ensuring personalized and relevant assistance over time
➔ **Job Matching with FAISS:** Use FAISS to match new job postings with previously favorited jobs, ensuring better personalization and more relevant job recommendations