

# BRIDGING THE SKILLS GAP WITH AI

An AI-powered platform to close the skill gap between job seekers and market needs.

## **Participants:**

Syeda Fakhira Saghir  
Aafreen Mughal  
Muhammad Raza

## **Roll No:**

22k-4413  
22k-4448  
22k-4499

# PRESENTING

TalentTune

*Level up. Skill smart. Get hired.*

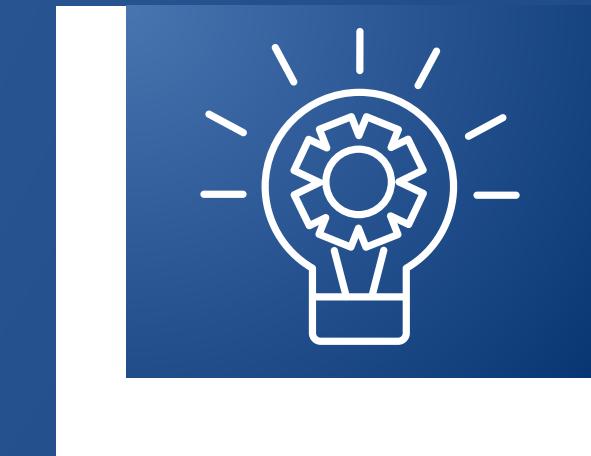




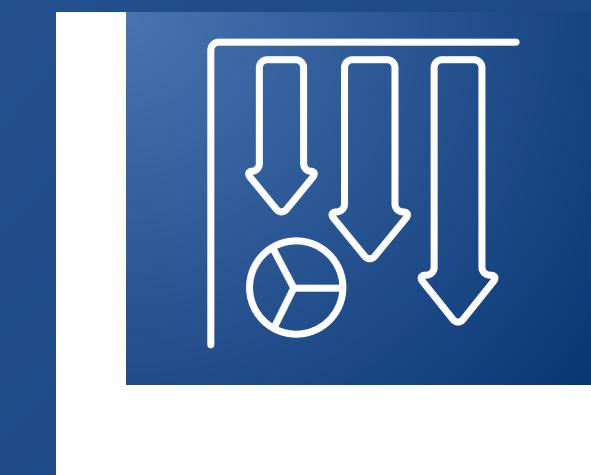
# THE PROBLEM: SKILL GAPS IN THE JOB MARKET



Job seekers lack clarity on what skills are needed



Employers struggle to find qualified candidates



Education and training are not aligned with market needs

# PROBLEM SOLUTIONS

1

Skill Gap Analysis using  
NLP and Taxonomy

2

Personalized Learning  
Pathways

3

Skill Verification &  
Digital Credentials

4

Intelligent Job  
Matching Engine

5

User Dashboard with  
Career Visualization

6

Scalable Cloud  
Platform with  
Integration APIs



# WHY OUR SOLUTION THE MOST IMPACTFUL

01

It's the foundation for personalization, learning, and job matching

02

Identifies exact skill gaps and transferable skills

03

Enables accurate, real-time market alignment

# HOW TO IMPLEMENT SKILL GAP ANALYSIS

1. Use NLP to parse resumes, profiles, and job descriptions
2. Reference ESCO/O\*NET + local industry data
3. Build dynamic skill taxonomies per industry
4. Match user profiles to job requirements
5. Highlight missing and transferable skills

# ADVANTAGES OF SKILL GAP ANALYSIS

- Provides personalized insight for each user
- Drives all other features (learning, matching)
- Can be continually improved with new data
- Applicable across industries and roles

# IMPLEMENTATION & IMPACT

Empowers users with data-driven career direction

Reduces mismatch between learning and jobs

Helps employers filter candidates effectively

Strengthens national workforce capability

# CONCLUSION

Skill Gap Analysis is the cornerstone of solving the skills mismatch.

→ When implemented well, it drives:

- Personalized learning
- Trustworthy credentials
- Smarter job matching

→ SkillBridge can transform Pakistan's employment landscape.

# OUR SOLUTION

```
skillbridge/
    ├── api/          # FastAPI backend
    |   ├── main.py
    |   └── dependencies.py
    ├── core/          # Business logic
    |   ├── nlp_processor.py
    |   ├── recommender.py
    |   └── models.py
    ├── db/            # Database operations
    |   ├── models.py
    |   └── crud.py
    ├── schemas/       # Pydantic models
    |   └── models.py
    └── requirements.txt
```

```

Restored session: Wed Apr 16 09:14:57 PKT 2025
/Users/saghirkhussain/.zshrc:1: no such file or directory: /opt/homebrew/bin/brew
/Users/saghirkhussain/.zshrc:2: no such file or directory: /opt/homebrew/bin/brew
saghirkhussain@Saghirs-MacBook-Air ~ % mkdir faar_hackathon
saghirkhussain@Saghirs-MacBook-Air ~ % mkdir hack2025
saghirkhussain@Saghirs-MacBook-Air ~ % cd hack2025
saghirkhussain@Saghirs-MacBook-Air hack2025 % python -m venv venv
zsh: command not found: python
saghirkhussain@Saghirs-MacBook-Air hack2025 % python3 -m venv venv
saghirkhussain@Saghirs-MacBook-Air hack2025 % source venv/bin/activate
(venv) saghirkhussain@Saghirs-MacBook-Air hack2025 % pip3 install spacy scikit-learn fastapi sentence-transformers psycopg2-binary uvicorn
Collecting spacy
  Downloading spacy-3.8.2.tar.gz (1.3 MB)
    1.3/1.3 MB 2.5 MB/s eta 0:00:00
  Installing build dependencies ... \
^canceled
ERROR: Operation cancelled by user
(venv) saghirkhussain@Saghirs-MacBook-Air hack2025 % pip3 install spacy scikit-learn fastapi sentence-transformers psycopg2-binary uvicorn
Collecting spacy
  Using cached spacy-3.8.2.tar.gz (1.3 MB)
  Installing build dependencies ... done
  Getting requirements to build wheel ... done
  Preparing metadata (pyproject.toml) ... done
Collecting scikit-learn
  Downloading scikit_learn-1.6.1-cp313-cp313-macosx_10_13_x86_64.whl.metadata (31 kB)
Collecting fastapi
  Downloading fastapi-0.115.12-py3-none-any.whl.metadata (27 kB)
Collecting sentence-transformers
  Downloading sentence_transformers-4.1.0-py3-none-any.whl.metadata (13 kB)
Collecting psycopg2-binary
  Downloading psycopg2_binary-2.9.10-cp313-cp313-macosx_12_0_x86_64.whl.metadata (4.9 kB)
Collecting uvicorn
  Downloading uvicorn-0.34.1-py3-none-any.whl.metadata (6.5 kB)
Collecting spacy-legacy<3.1.0,>=3.0.11 (from spacy)
  Downloading spacy_legacy-3.0.12-py2.py3-none-any.whl.metadata (2.8 kB)
Collecting spacy-loggers<2.0.0,>=1.0.0 (from spacy)
  Downloading spacy_loggers-1.0.5-py3-none-any.whl.metadata (23 kB)
Collecting murmurhash<1.1.0,>=0.28.0 (from spacy)
  Using cached murmurhash-1.0.12-cp313-cp313-macosx_10_13_x86_64.whl.metadata (2.1 kB)
Collecting cymem<2.1.0,>=2.0.2 (from spacy)
  Using cached cymem-2.0.11-cp313-cp313-macosx_10_13_x86_64.whl.metadata (8.5 kB)
Collecting preshed<3.1.0,>=3.0.2 (from spacy)

Using cached click-8.1.8-py3-none-any.whl (98 kB)
Downloading h11-0.14.0-py3-none-any.whl (58 kB)
Downloading httptools-0.6.4-cp313-cp313-macosx_10_13_universal2.whl (197 kB)
Downloading python_dotenv-1.1.0-py3-none-any.whl (20 kB)
Downloading PyYAML-6.0.2-cp313-cp313-macosx_10_13_x86_64.whl (181 kB)
Downloading uvloop-0.21.0-cp313-cp313-macosx_10_13_x86_64.whl (819 kB)
  819.3/819.3 kB 1.4 MB/s eta 0:00:00
Downloading watchfiles-1.0.5-cp313-cp313-macosx_10_12_x86_64.whl (401 kB)
Downloading websockets-15.0.1-cp313-cp313-macosx_10_13_x86_64.whl (173 kB)
Downloading uvicorn-0.34.1-py3-none-any.whl (62 kB)
Downloading anyio-4.9.0-py3-none-any.whl (100 kB)
Downloading idna-3.10-py3-none-any.whl (70 kB)
Downloading sniffio-1.3.1-py3-none-any.whl (10 kB)
Installing collected packages: websockets, uvloop, sniffio, pyyaml, python-dotenv, idna, httptools, h11, click, uvicorn, anyio, watchfiles
Successfully installed anyio-4.9.0 click-8.1.8 h11-0.14.0 httptools-0.6.4 idna-3.10 python-dotenv-1.1.0 pyyaml-6.0.2 sniffio-1.3.1 uvicorn-0.34.1 uvloop-0.21.0 watchfiles-1.0.5 websockets-15.0.1
(venv) saghirkhussain@Saghirs-MacBook-Air hack2025 %

```

```

# Create project
mkdir nlp-student-project
cd nlp-student-project
python -m venv venv
source venv/bin/activate # Linux/Mac
# venv\Scripts\activate # Windows

# Install core packages
pip install spacy scikit-learn fastapi sentence-transformers psycopg2-binary uvicorn
pip install "uvicorn[standard]" # For production

```

```
(venv) saghirhussain@Saghirs-MacBook-Air hack2025 % pip install sentence-transformers
Collecting sentence-transformers
  Using cached sentence_transformers-4.1.0-py3-none-any.whl.metadata (13 kB)
Collecting transformers<5.0.0,>=4.41.0 (from sentence-transformers)
  Using cached transformers-4.51.3-py3-none-any.whl.metadata (38 kB)
Collecting tqdm (from sentence-transformers)
  Using cached tqdm-4.67.1-py3-none-any.whl.metadata (57 kB)
INFO: pip is looking at multiple versions of sentence-transformers to determine which version is compatible with other requirements.
Collecting sentence-transformers
  Using cached sentence_transformers-4.0.2-py3-none-any.whl.metadata (13 kB)
  Using cached sentence_transformers-4.0.1-py3-none-any.whl.metadata (13 kB)
  Using cached sentence_transformers-4.0.0-py3-none-any.whl.metadata (13 kB)
  Using cached sentence_transformers-3.4.1-py3-none-any.whl.metadata (10 kB)
  Using cached sentence_transformers-3.4.0-py3-none-any.whl.metadata (10 kB)
  Using cached sentence_transformers-3.3.1-py3-none-any.whl.metadata (10 kB)
  Using cached sentence_transformers-3.3.0-py3-none-any.whl.metadata (10 kB)
INFO: pip is still looking at multiple versions of sentence-transformers to determine which version is compatible with other requirements.
Using cached sentence_transformers-3.2.1-py3-none-any.whl.metadata (10 kB)
Using cached sentence_transformers-3.2.0-py3-none-any.whl.metadata (10 kB)
Using cached sentence_transformers-3.1.1-py3-none-any.whl.metadata (10 kB)
Using cached sentence_transformers-3.1.0-py3-none-any.whl.metadata (23 kB)
Using cached sentence_transformers-3.0.1-py3-none-any.whl.metadata (10 kB)
INFO: This is taking longer than usual. You might need to provide the dependency resolver with stricter constraints to reduce .io/warnings/backtracking for guidance. If you want to abort this run, press Ctrl + C.
Using cached sentence_transformers-3.0.0-py3-none-any.whl.metadata (10 kB)
Using cached sentence_transformers-2.7.0-py3-none-any.whl.metadata (11 kB)
Using cached sentence_transformers-2.6.1-py3-none-any.whl.metadata (11 kB)
Using cached sentence_transformers-2.6.0-py3-none-any.whl.metadata (11 kB)
Using cached sentence_transformers-2.5.1-py3-none-any.whl.metadata (11 kB)
Using cached sentence_transformers-2.5.0-py3-none-any.whl.metadata (11 kB)
Using cached sentence_transformers-2.4.0-py3-none-any.whl.metadata (11 kB)
Using cached sentence_transformers-2.3.1-py3-none-any.whl.metadata (11 kB)
Using cached sentence_transformers-2.3.0-py3-none-any.whl.metadata (11 kB)
Using cached sentence_transformers-2.2.2.tar.gz (85 kB)
Installing build dependencies ... done
Getting requirements to build wheel ... done
Preparing metadata (pyproject.toml) ... done
Using cached sentence-transformers-2.2.1.tar.gz (84 kB)
```



# Talent Tune

Paste your resume text below:

## PROJECTS

- RAAS – Personal Assistant (Sep 2024 – Dec 2024)
- Friends Recommendation System on Social Networks (Oct 2024 – Nov 2024)
- NumParLib – Numerical Parallel Library (Oct 2024 – Nov 2024)
- Task Manager in Linux (Apr 2024 – May 2024)
- Moore to Mealy & Mealy to Moore Conversion (Apr 2024)
- Task Pro – Task Management System (Oct 2023 – Dec 2023)
- Human vs AI – Emotional Intelligence Study (Oct 2023 – Nov 2023)
- Hostel Mess Management System (Mar 2023 – May 2023)
- Mind Frame Assistant (Oct 2022 – Dec 2022)

Select your target job role:

data scientist

Analyze

## Current Skills Found

▼ [

```
 0 : "linkedin"  
 1 : "c"
```

Hostel Mess Management System (Mar 2023 – May 2023)  
Mind Frame Assistant (Oct 2022 – Dec 2022)

Select your target job role:

data scientist

Analyze

### Current Skills Found

- ✓ [
  - 0 : "linkedin"
  - 1 : "c"
  - 2 : "mongodb"
  - 3 : "linux"
  - 4 : "c++"
  - 5 : "python"
  - 6 : "bash"
  - 7 : "ssis"
  - 8 : "react"
  - 9 : "node.js"
  - 10 : "git"
  - 11 : "java"
  - 12 : "sql"
  - 13 : "problem solving"
  - 14 : "oop"



**THANK  
YOU**