

```
!pip install langchain
!pip install langgraph
!pip install openai
!pip install PyPDF2
!pip install scikit-learn
!pip install -U langchain-tavily
!pip install textstat
!pip install -U langchain-community
!pip install arxiv --upgrade
!pip install Pydantic
!pip install langchain_core
!pip install langchain_openai
!pip install serpapi
!pip install google-search-results
!pip install scikit-learn
!pip install gensim
!pip install nltk
!pip install pypdf
!pip install numpy
!pip install --force-reinstall --no-cache-dir numpy gensim
!pip install faiss-cpu
!pip install tiktoken
!pip install langchain_google_vertexai
!pip install google-generativeai
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Requirement already satisfied: langchain in /usr/local/lib/python3.11/dist-packages (0.3.25)
Requirement already satisfied: langchain-core<1.0.0,>=0.3.58 in /usr/local/lib/python3.11/dist-packages (from langchain) (0.3.63)
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Requirement already satisfied: attrs>=17.3.0 in /usr/local/lib/python3.11/dist-packages (from aiohttp<4.0.0,>=3.11.14->langchain-tav
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Requirement already satisfied: typing-inspect<1,>=0.4.0 in /usr/local/lib/python3.11/dist-packages (from dataclasses-json<0.7,>=0.5
Requirement already satisfied: langchain-text-splitters<1.0.0,>=0.3.8 in /usr/local/lib/python3.11/dist-packages (from langchain<1.6
Requirement already satisfied: pydantic<3.0.0,>=2.7.4 in /usr/local/lib/python3.11/dist-packages (from langchain<1.0.0,>=0.3.25->lar
Requirement already satisfied: jsonpatch<2.0,>=1.33 in /usr/local/lib/python3.11/dist-packages (from langchain-core<1.0.0,>=0.3.59->
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Requirement already satisfied: httpx<1,>=0.23.0 in /usr/local/lib/python3.11/dist-packages (from langsmith<0.4,>=0.1.125->langchain
Requirement already satisfied: orjson<4.0.0,>=3.9.14 in /usr/local/lib/python3.11/dist-packages (from langsmith<0.4,>=0.1.125->langc
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Requirement already satisfied: certifi>=2017.4.17 in /usr/local/lib/python3.11/dist-packages (from requests<3,>=2->langchain-communi
Requirement already satisfied: greenlet>=1 in /usr/local/lib/python3.11/dist-packages (from SQLAlchemy<=1.4->langchain-community
Requirement already satisfied: anyio in /usr/local/lib/python3.11/dist-packages (from httpx<1,>=0.23.0->langsmith<0.4,>=0.1.125->lar
Requirement already satisfied: httpcore==1.* in /usr/local/lib/python3.11/dist-packages (from httpx<1,>=0.23.0->langsmith<0.4,>=0.1
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Requirement already satisfied: annotated-types>=0.6.0 in /usr/local/lib/python3.11/dist-packages (from pydantic<3.0.0,>=2.7.4->langc
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Requirement already satisfied: arxiv in /usr/local/lib/python3.11/dist-packages (2.2.0)
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Requirement already satisfied: charset-normalizer<4,>=2 in /usr/local/lib/python3.11/dist-packages (from requests<3.0.0,>=2.32.0->arxiv) (

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Requirement already satisfied: urllib3<3,>=1.21.1 in /usr/local/lib/python3.11/dist-packages (from requests==2.32.0->arxiv) (2.4.0)
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Requirement already satisfied: langchain_core in /usr/local/lib/python3.11/dist-packages (0.3.63)
Requirement already satisfied: langsmith<0.4,>=0.1.126 in /usr/local/lib/python3.11/dist-packages (from langchain_core) (0.3.43)
Requirement already satisfied: tenacity!=8.4.0,<10.0.0,>=8.1.0 in /usr/local/lib/python3.11/dist-packages (from langchain_core) (9.1)
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Requirement already satisfied: h11>=0.16 in /usr/local/lib/python3.11/dist-packages (from httpcore==1.*->httpx<1,>=0.23.0->langsmith<0.4,>=0.1.126->langchain_core) (0.14.0)
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Requirement already satisfied: sniffio>=1.1 in /usr/local/lib/python3.11/dist-packages (from anyio->httpx<1,>=0.23.0->langsmith<0.4,>=0.1.126->langchain_core) (1.3.1)
Requirement already satisfied: langchain_openai in /usr/local/lib/python3.11/dist-packages (0.3.19)
Requirement already satisfied: langchain-core<1.0.0,>=0.3.63 in /usr/local/lib/python3.11/dist-packages (from langchain_openai) (0.3.63)
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Requirement already satisfied: regex>=2022.1.18 in /usr/local/lib/python3.11/dist-packages (from tiktoken<1,>=0.7->langchain_openai) (2024.11.1)
Requirement already satisfied: requests==2.26.0 in /usr/local/lib/python3.11/dist-packages (from tiktoken<1,>=0.7->langchain_openai) (2.32.0)
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Requirement already satisfied: serpapi in /usr/local/lib/python3.11/dist-packages (0.1.5)
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Requirement already satisfied: certifi>=2017.4.17 in /usr/local/lib/python3.11/dist-packages (from requests->google-search-results) (2025.4.26)
Requirement already satisfied: scikit-learn in /usr/local/lib/python3.11/dist-packages (1.6.1)
Requirement already satisfied: numpy>=1.19.5 in /usr/local/lib/python3.11/dist-packages (from scikit-learn) (1.26.4)
Requirement already satisfied: scipy>=1.6.0 in /usr/local/lib/python3.11/dist-packages (from scikit-learn) (1.13.1)
Requirement already satisfied: joblib>=1.2.0 in /usr/local/lib/python3.11/dist-packages (from scikit-learn) (1.5.1)
Requirement already satisfied: threadpoolctl>=3.1.0 in /usr/local/lib/python3.11/dist-packages (from scikit-learn) (3.6.0)
Requirement already satisfied: gensim in /usr/local/lib/python3.11/dist-packages (4.3.3)
Requirement already satisfied: numpy<2.0,>=1.18.5 in /usr/local/lib/python3.11/dist-packages (from gensim) (1.26.4)
Requirement already satisfied: scipy<1.14.0,>=1.7.0 in /usr/local/lib/python3.11/dist-packages (from gensim) (1.13.1)
Requirement already satisfied: smart-open>=1.8.1 in /usr/local/lib/python3.11/dist-packages (from gensim) (7.1.0)
Requirement already satisfied: wrapt in /usr/local/lib/python3.11/dist-packages (from smart-open>=1.8.1->gensim) (1.17.2)
Requirement already satisfied: nltk in /usr/local/lib/python3.11/dist-packages (3.9.1)
Requirement already satisfied: click in /usr/local/lib/python3.11/dist-packages (from nltk) (8.2.1)
Requirement already satisfied: joblib in /usr/local/lib/python3.11/dist-packages (from nltk) (1.5.1)
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Requirement already satisfied: regex<=2021.8.3 in /usr/local/lib/python3.11/dist-packages (from nltk) (2024.11.6)
Requirement already satisfied: tqdm in /usr/local/lib/python3.11/dist-packages (from nltk) (4.67.1)
Requirement already satisfied: pypdf in /usr/local/lib/python3.11/dist-packages (5.6.0)
Requirement already satisfied: numpy in /usr/local/lib/python3.11/dist-packages (1.26.4)
Collecting numpy
  Downloading numpy-2.2.6-cp311-cp311-manylinux_2_17_x86_64.manylinux2014_x86_64.whl.metadata (62 kB)
    62.0/62.0 kB 2.3 MB/s eta 0:00:00
Collecting gensim
  Downloading gensim-4.3.3-cp311-cp311-manylinux_2_17_x86_64.manylinux2014_x86_64.whl.metadata (8.1 kB)
Collecting numpy
  Downloading numpy-1.26.4-cp311-cp311-manylinux_2_17_x86_64.manylinux2014_x86_64.whl.metadata (61 kB)
    61.0/61.0 kB 14.3 MB/s eta 0:00:00
Collecting scipy<1.14.0,>=1.7.0 (from gensim)
  Downloading scipy-1.13.1-cp311-cp311-manylinux_2_17_x86_64.manylinux2014_x86_64.whl.metadata (60 kB)
    60.6/60.6 kB 198.5 MB/s eta 0:00:00
Collecting smart-open>=1.8.1 (from gensim)
  Downloading smart_open-7.1.0-py3-none-any.whl.metadata (24 kB)
Collecting wrapt (from smart-open>=1.8.1->gensim)
  Downloading wrapt-1.17.2-cp311-cp311-manylinux_2_5_x86_64.manylinux1_x86_64.manylinux_2_17_x86_64.manylinux2014_x86_64.whl.metadata (8.1 kB)
Download gensim-4.3.3-cp311-cp311-manylinux_2_17_x86_64.manylinux2014_x86_64.whl (26.7 MB)
    26.7/26.7 MB 226.0 MB/s eta 0:00:00
Download numpy-1.26.4-cp311-cp311-manylinux_2_17_x86_64.manylinux2014_x86_64.whl (18.3 MB)
    18.3/18.3 MB 202.5 MB/s eta 0:00:00
Download scipy-1.13.1-cp311-cp311-manylinux_2_17_x86_64.manylinux2014_x86_64.whl (38.6 MB)
    38.6/38.6 MB 228.5 MB/s eta 0:00:00
Download smart_open-7.1.0-py3-none-any.whl (61 kB)
    61.7/61.7 kB 217.2 MB/s eta 0:00:00
Download wrapt-1.17.2-cp311-cp311-manylinux_2_5_x86_64.manylinux1_x86_64.manylinux_2_17_x86_64.manylinux2014_x86_64.whl (83 kB)
    83.2/83.2 kB 160.9 MB/s eta 0:00:00
Installing collected packages: wrapt, numpy, smart-open, scipy, gensim
  Attempting uninstall: wrapt
    Found existing installation: wrapt 1.17.2
    Uninstalling wrapt-1.17.2:
      Successfully uninstalled wrapt-1.17.2
  Attempting uninstall: numpy
    Found existing installation: numpy 1.26.4
    Uninstalling numpy-1.26.4:
      Successfully uninstalled numpy-1.26.4
  Attempting uninstall: smart-open
    Found existing installation: smart-open 7.1.0
    Uninstalling smart-open-7.1.0:
      Successfully uninstalled smart-open-7.1.0
  Attempting uninstall: scipy
    Found existing installation: scipy 1.13.1
    Uninstalling scipy-1.13.1:
      Successfully uninstalled scipy-1.13.1
  Attempting uninstall: gensim
    Found existing installation: gensim 4.3.3
    Uninstalling gensim-4.3.3:
      Successfully uninstalled gensim-4.3.3
ERROR: pip's dependency resolver does not currently take into account all the packages that are installed. This behaviour is the sou
tsfresh 0.21.0 requires scipy>=1.14.0; python_version >= "3.10", but you have scipy 1.13.1 which is incompatible.
thinc 8.3.6 requires numpy<3.0.0,>=2.0.0, but you have numpy 1.26.4 which is incompatible.
Successfully installed gensim-4.3.3 numpy-1.26.4 scipy-1.13.1 smart-open-7.1.0 wrapt-1.17.2
Requirement already satisfied: faiss-cpu in /usr/local/lib/python3.11/dist-packages (1.11.0)
Requirement already satisfied: numpy<3.0,>=1.25.0 in /usr/local/lib/python3.11/dist-packages (from faiss-cpu) (1.26.4)
Requirement already satisfied: packaging in /usr/local/lib/python3.11/dist-packages (from faiss-cpu) (24.2)
Requirement already satisfied: tiktoken in /usr/local/lib/python3.11/dist-packages (from requests>=2.26.0->tiktoken) (0.9.0)
Requirement already satisfied: regex<=2022.1.18 in /usr/local/lib/python3.11/dist-packages (from tiktoken) (2024.11.6)
Requirement already satisfied: requests>=2.26.0 in /usr/local/lib/python3.11/dist-packages (from tiktoken) (2.32.3)
Requirement already satisfied: charset-normalizer<4,>=2 in /usr/local/lib/python3.11/dist-packages (from requests>=2.26.0->tiktoken) (3.10)
Requirement already satisfied: idna<4,>=2.5 in /usr/local/lib/python3.11/dist-packages (from requests>=2.26.0->tiktoken) (2.4)
Requirement already satisfied: urllib3<3,>=1.21.1 in /usr/local/lib/python3.11/dist-packages (from requests>=2.26.0->tiktoken) (2.0.2)
Requirement already satisfied: certifi>=2017.4.17 in /usr/local/lib/python3.11/dist-packages (from requests>=2.26.0->tiktoken) (2025.1.1)
Requirement already satisfied: langchain_google_vertexai in /usr/local/lib/python3.11/dist-packages (2.0.24)
Requirement already satisfied: bottleneck<2.0.0,>=1.4.2 in /usr/local/lib/python3.11/dist-packages (from langchain_google_vertexai) (1.4.2)
Requirement already satisfied: google-cloud-aiplatform<2.0.0,>=1.92.0 in /usr/local/lib/python3.11/dist-packages (from langchain_google_vertexai) (1.92.0)
Requirement already satisfied: google-cloud-storage<3.0.0,>=2.18.0 in /usr/local/lib/python3.11/dist-packages (from langchain_google_vertexai) (2.18.0)
Requirement already satisfied: httpx<0.29.0,>=0.28.0 in /usr/local/lib/python3.11/dist-packages (from langchain_google_vertexai) (0.29.0)
Requirement already satisfied: httpx-sse<0.5.0,>=0.4.0 in /usr/local/lib/python3.11/dist-packages (from langchain_google_vertexai) (0.4.0)
Requirement already satisfied: langchain-core<0.4,>=0.3.55 in /usr/local/lib/python3.11/dist-packages (from langchain_google_vertexai) (0.3.55)
Requirement already satisfied: numexpr<3.0.0,>=2.8.6 in /usr/local/lib/python3.11/dist-packages (from langchain_google_vertexai) (2.8.6)
Requirement already satisfied: pyarrow<20.0.0,>=19.0.1 in /usr/local/lib/python3.11/dist-packages (from langchain_google_vertexai) (19.0.1)
Requirement already satisfied: pydantic<3.0,>=2.9 in /usr/local/lib/python3.11/dist-packages (from langchain_google_vertexai) (2.11.10)
Requirement already satisfied: validators<1,>=0.22.0 in /usr/local/lib/python3.11/dist-packages (from langchain_google_vertexai) (0.22.0)
Requirement already satisfied: numpy in /usr/local/lib/python3.11/dist-packages (from bottleneck<2.0.0,>=1.4.2->langchain_google_ver) (1.26.4)
Requirement already satisfied: google-api-core!=2.0.*,!=2.1.*,!=2.2.*,!=2.3.*,!=2.4.*,!=2.5.*,!=2.6.*,!=2.7.*,<3.0.0,>=1.34.1 in /usr/local/lib/python3.11/dist-packages (from google-cloud-aiplatform<2.0.0,>=1.92.0) (2.19.0)
Requirement already satisfied: google-auth<3.0.0,>=2.14.1 in /usr/local/lib/python3.11/dist-packages (from google-cloud-aiplatform<2.0.0,>=1.92.0) (2.33.0)
Requirement already satisfied: proto-plus<2.0.0,>=1.22.3 in /usr/local/lib/python3.11/dist-packages (from google-cloud-aiplatform<2.0.0,>=1.92.0) (1.24.0)
Requirement already satisfied: protobuf!=4.21.0,!<4.21.1,!>4.21.2,!>4.21.3,!<4.21.4,!>4.21.5,<7.0.0,>=3.20.2 in /usr/local/lib/python3.11/dist-packages (from google-cloud-aiplatform<2.0.0,>=1.92.0) (4.21.5)
Requirement already satisfied: packaging>=14.3 in /usr/local/lib/python3.11/dist-packages (from google-cloud-aiplatform<2.0.0,>=1.92.0) (24.2)
Requirement already satisfied: google-cloud-bigquery!=3.20.0,<4.0.0,>=1.15.0 in /usr/local/lib/python3.11/dist-packages (from google-cloud-aiplatform<2.0.0,>=1.92.0) (3.20.0)
Requirement already satisfied: google-cloud-resource-manager<3.0.0,>=1.3.3 in /usr/local/lib/python3.11/dist-packages (from google-cloud-aiplatform<2.0.0,>=1.92.0) (1.3.3)
Requirement already satisfied: shapely<3.0.0 in /usr/local/lib/python3.11/dist-packages (from google-cloud-aiplatform<2.0.0,>=1.92.0) (2.0.6)
Requirement already satisfied: google-genai<2.0.0,>=1.0.0 in /usr/local/lib/python3.11/dist-packages (from google-cloud-aiplatform<2.0.0,>=1.92.0) (1.0.0)
Requirement already satisfied: typing-extensions in /usr/local/lib/python3.11/dist-packages (from google-cloud-aiplatform<2.0.0,>=1.92.0) (4.12.0)
Requirement already satisfied: docstring-parser<1 in /usr/local/lib/python3.11/dist-packages (from google-cloud-aiplatform<2.0.0,>=1.92.0) (0.16.1)
Requirement already satisfied: google-cloud-core<3.0dev,>=2.3.0 in /usr/local/lib/python3.11/dist-packages (from google-cloud-storage<3.0.0,>=2.18.0) (2.3.0)
Requirement already satisfied: google-resumable-media>=2.7.2 in /usr/local/lib/python3.11/dist-packages (from google-cloud-storage<3.0.0,>=2.18.0) (2.7.2)
Requirement already satisfied: requests<3.0.0dev,>=2.18.0 in /usr/local/lib/python3.11/dist-packages (from google-cloud-storage<3.0.0,>=2.18.0) (2.32.3)
Requirement already satisfied: google-crc32c<2.0dev,>=1.0 in /usr/local/lib/python3.11/dist-packages (from google-cloud-storage<3.0.0,>=2.18.0) (1.0.0)
```



```

Requirement already satisfied: google-cloud-storage<2.0.0dev,>=1.0.0 in /usr/local/lib/python3.11/dist-packages (from httpx<0.29.0,>=0.28.0->langchain_google_vertexai)
Requirement already satisfied: anyio in /usr/local/lib/python3.11/dist-packages (from httpx<0.29.0,>=0.28.0->langchain_google_vertexai)
Requirement already satisfied: certifi in /usr/local/lib/python3.11/dist-packages (from httpx<0.29.0,>=0.28.0->langchain_google_vertexai)
Requirement already satisfied: httpcore==1.* in /usr/local/lib/python3.11/dist-packages (from httpx<0.29.0,>=0.28.0->langchain_google_vertexai)
Requirement already satisfied: idna in /usr/local/lib/python3.11/dist-packages (from httpx<0.29.0,>=0.28.0->langchain_google_vertexai)
Requirement already satisfied: h11<0.16 in /usr/local/lib/python3.11/dist-packages (from httpcore==1.*->httpx<0.29.0,>=0.28.0->langchain_google_vertexai)
Requirement already satisfied: langsmith<0.4,>=0.1.126 in /usr/local/lib/python3.11/dist-packages (from langchain-core<0.4,>=0.3.55->langchain-google-genai)
Requirement already satisfied: tenacity!=8.4.0,<10.0.0,>=8.1.0 in /usr/local/lib/python3.11/dist-packages (from langchain-core<0.4,>=0.3.55->langchain-google-genai)
Requirement already satisfied: jsonpatch<2.0,>=1.33 in /usr/local/lib/python3.11/dist-packages (from langchain-core<0.4,>=0.3.55->langchain-google-genai)
Requirement already satisfied: PyYAML>=5.3 in /usr/local/lib/python3.11/dist-packages (from langchain-core<0.4,>=0.3.55->langchain-google-genai)
Requirement already satisfied: annotated-types>=0.6.0 in /usr/local/lib/python3.11/dist-packages (from pydantic<3.0,>=2.9->langchain-google-genai)
Requirement already satisfied: pydantic-core==2.33.2 in /usr/local/lib/python3.11/dist-packages (from pydantic<3.0,>=2.9->langchain-google-genai)
Requirement already satisfied: typing-inspection>=0.4.0 in /usr/local/lib/python3.11/dist-packages (from pydantic<3.0,>=2.9->langchain-google-genai)
Requirement already satisfied: googleapis-common-protos<2.0.0,>=1.56.2 in /usr/local/lib/python3.11/dist-packages (from google-api-core[grpc]<2.0.0dev,>=1.33.2->google-cloud-bigquery)
Requirement already satisfied: grpcio<2.0dev,>=1.33.2 in /usr/local/lib/python3.11/dist-packages (from google-api-core[grpc]<2.0.0dev,>=1.33.2->google-cloud-bigquery)
Requirement already satisfied: grpcio-status<2.0.dev0,>=1.33.2 in /usr/local/lib/python3.11/dist-packages (from google-api-core[grpc]<2.0.0dev,>=1.33.2->google-cloud-bigquery)
Requirement already satisfied: cachetools<6.0,>=2.0.0 in /usr/local/lib/python3.11/dist-packages (from google-auth<3.0.0,>=2.14.1->google-cloud-bigquery)
Requirement already satisfied: pyasn1-modules>=0.2.1 in /usr/local/lib/python3.11/dist-packages (from google-auth<3.0.0,>=2.14.1->google-cloud-bigquery)
Requirement already satisfied: rsa<5,>=3.1.4 in /usr/local/lib/python3.11/dist-packages (from google-auth<3.0.0,>=2.14.1->google-cloud-bigquery)
Requirement already satisfied: python-dateutil<3.0.0,>=2.8.2 in /usr/local/lib/python3.11/dist-packages (from google-cloud-bigquery)
Requirement already satisfied: grpc-google-iam-v1<1.0.0,>=0.14.0 in /usr/local/lib/python3.11/dist-packages (from google-cloud-bigquery)
Requirement already satisfied: websockets<15.1.0,>=13.0.0 in /usr/local/lib/python3.11/dist-packages (from google-genai<2.0.0,>=1.0.0->langchain-google-genai)
Requirement already satisfied: sniffio>=1.1 in /usr/local/lib/python3.11/dist-packages (from anyio->httpx<0.29.0,>=0.28.0->langchain-google-genai)
Requirement already satisfied: jsonpointer>=1.9 in /usr/local/lib/python3.11/dist-packages (from jsonpatch<2.0,>=1.33->langchain-google-genai)
Requirement already satisfied: orjson<4.0.0,>=3.9.14 in /usr/local/lib/python3.11/dist-packages (from langsmith<0.4,>=0.1.126->langchain-google-genai)
Requirement already satisfied: requests-toolbelt<2.0.0,>=1.0.0 in /usr/local/lib/python3.11/dist-packages (from langsmith<0.4,>=0.1.126->langchain-google-genai)
Requirement already satisfied: zstandard<0.24.0,>=0.23.0 in /usr/local/lib/python3.11/dist-packages (from langsmith<0.4,>=0.1.126->langchain-google-genai)
Requirement already satisfied: charset-normalizer<4,>=2 in /usr/local/lib/python3.11/dist-packages (from requests<3.0.0dev,>=2.18.0->google-cloud-bigquery)
Requirement already satisfied: urllib3<3,>=1.21.1 in /usr/local/lib/python3.11/dist-packages (from requests<3.0.0dev,>=2.18.0->google-cloud-bigquery)
Requirement already satisfied: pyasn1<0.7.0,>=0.6.1 in /usr/local/lib/python3.11/dist-packages (from pyasn1-modules>=0.2.1->google-cloud-bigquery)
Requirement already satisfied: six>=1.5 in /usr/local/lib/python3.11/dist-packages (from python-dateutil<3.0.0,>=2.8.2->google-cloud-bigquery)
Requirement already satisfied: google-generativeai in /usr/local/lib/python3.11/dist-packages (0.8.5)
Collecting google-ai-generativelanguage==0.6.15 (from google-generativeai)
  Downloading google_ai_generativelanguage-0.6.15-py3-none-any.whl.metadata (5.7 kB)
Requirement already satisfied: google-api-core in /usr/local/lib/python3.11/dist-packages (from google-generativeai) (2.24.2)
Requirement already satisfied: google-api-python-client in /usr/local/lib/python3.11/dist-packages (from google-generativeai) (2.17.0)
Requirement already satisfied: google-auth>=2.15.0 in /usr/local/lib/python3.11/dist-packages (from google-generativeai) (2.38.0)
Requirement already satisfied: protobuf in /usr/local/lib/python3.11/dist-packages (from google-generativeai) (5.29.5)
Requirement already satisfied: pydantic in /usr/local/lib/python3.11/dist-packages (from google-generativeai) (2.11.5)
Requirement already satisfied: tqdm in /usr/local/lib/python3.11/dist-packages (from google-generativeai) (4.67.1)
Requirement already satisfied: typing-extensions in /usr/local/lib/python3.11/dist-packages (from google-generativeai) (4.13.2)
Requirement already satisfied: proto-plus<2.0.0dev,>=1.22.3 in /usr/local/lib/python3.11/dist-packages (from google-ai-generativelanguage)
Requirement already satisfied: googleapis-common-protos<2.0.0,>=1.56.2 in /usr/local/lib/python3.11/dist-packages (from google-api-core[grpc]<2.0.0dev,>=1.33.2->google-cloud-bigquery)
Requirement already satisfied: requests<3.0.0,>=2.18.0 in /usr/local/lib/python3.11/dist-packages (from google-api-core[grpc]<2.0.0dev,>=1.33.2->google-cloud-bigquery)
Requirement already satisfied: cachetools<6.0,>=2.0.0 in /usr/local/lib/python3.11/dist-packages (from google-auth>=2.15.0->google-cloud-bigquery)
Requirement already satisfied: pyasn1-modules>=0.2.1 in /usr/local/lib/python3.11/dist-packages (from google-auth>=2.15.0->google-cloud-bigquery)
Requirement already satisfied: rsa<5,>=3.1.4 in /usr/local/lib/python3.11/dist-packages (from google-auth>=2.15.0->google-cloud-bigquery)
Requirement already satisfied: httplib2<1.0.0,>=0.19.0 in /usr/local/lib/python3.11/dist-packages (from google-api-python-client>=2.17.0->google-cloud-bigquery)
Requirement already satisfied: google-auth-httplib2<1.0.0,>=0.2.0 in /usr/local/lib/python3.11/dist-packages (from google-api-python-client>=2.17.0->google-cloud-bigquery)
Requirement already satisfied: uritemplate<5,>=3.0.1 in /usr/local/lib/python3.11/dist-packages (from google-api-python-client>=2.17.0->google-cloud-bigquery)
Requirement already satisfied: annotated-types>=0.6.0 in /usr/local/lib/python3.11/dist-packages (from pydantic->google-generativeai)
Requirement already satisfied: pydantic-core==2.33.2 in /usr/local/lib/python3.11/dist-packages (from pydantic->google-generativeai)
Requirement already satisfied: typing-inspection>=0.4.0 in /usr/local/lib/python3.11/dist-packages (from pydantic->google-generativeai)
Requirement already satisfied: grpcio<2.0dev,>=1.33.2 in /usr/local/lib/python3.11/dist-packages (from google-api-core[grpc]<2.0.0dev,>=1.33.2->google-cloud-bigquery)
Requirement already satisfied: grpcio-status<2.0.dev0,>=1.33.2 in /usr/local/lib/python3.11/dist-packages (from google-api-core[grpc]<2.0.0dev,>=1.33.2->google-cloud-bigquery)
Requirement already satisfied: pyparsing!=3.0.0,!=3.0.1,!=3.0.2,!=3.0.3,<4,>=2.4.2 in /usr/local/lib/python3.11/dist-packages (from google-cloud-bigquery)
Requirement already satisfied: pyasn1<0.7.0,>=0.6.1 in /usr/local/lib/python3.11/dist-packages (from pyasn1-modules>=0.2.1->google-cloud-bigquery)
Requirement already satisfied: charset-normalizer<4,>=2 in /usr/local/lib/python3.11/dist-packages (from requests<3.0.0,>=2.18.0->google-cloud-bigquery)
Requirement already satisfied: idna<4,>=2.5 in /usr/local/lib/python3.11/dist-packages (from requests<3.0.0,>=2.18.0->google-cloud-bigquery)
Requirement already satisfied: urllib3<3,>=1.21.1 in /usr/local/lib/python3.11/dist-packages (from requests<3.0.0,>=2.18.0->google-cloud-bigquery)
Requirement already satisfied: certifi>=2017.4.17 in /usr/local/lib/python3.11/dist-packages (from requests<3.0.0,>=2.18.0->google-cloud-bigquery)
Downloading google_ai_generativelanguage-0.6.15-py3-none-any.whl (1.3 MB)
  1.3/1.3 MB 11.2 MB/s eta 0:00:00
Installing collected packages: google-ai-generativelanguage
  Attempting uninstall: google-ai-generativelanguage
    Found existing installation: google-ai-generativelanguage 0.6.18
    Uninstalling google-ai-generativelanguage-0.6.18:
      Successfully uninstalled google-ai-generativelanguage-0.6.18
ERROR: pip's dependency resolver does not currently take into account all the packages that are installed. This behaviour is the source of the following dependency conflicts.
langchain-google-genai 2.1.5 requires google-ai-generativelanguage<0.7.0,>=0.6.18, but you have google-ai-generativelanguage 0.6.15
Successfully installed google-ai-generativelanguage-0.6.15

```

```
!pip install langchain_google_genai
```

```
Requirement already satisfied: langchain_google_genai in /usr/local/lib/python3.11/dist-packages (2.1.5)
Requirement already satisfied: filetype<2.0.0,>=1.2.0 in /usr/local/lib/python3.11/dist-packages (from langchain_google_genai) (1.2)
Collecting google-ai-generativelanguage<0.7.0,>=0.6.18 (from langchain_google_genai)
  Using cached google_ai_generativelanguage-0.6.18-py3-none-any.whl.metadata (9.8 kB)
Requirement already satisfied: langchain-core<0.4.0,>=0.3.62 in /usr/local/lib/python3.11/dist-packages (from langchain_google_genai)
Requirement already satisfied: pydantic<3,>=2 in /usr/local/lib/python3.11/dist-packages (from langchain_google_genai) (2.11.5)
Requirement already satisfied: google-api-core!=2.0.*,!=2.1.*,!=2.10.*,!=2.2.*,!=2.3.*,!=2.4.*,!=2.5.*,!=2.6.*,!=2.7.*,!=2.8.*,!=2.9.* in /usr/local/lib/python3.11/dist-packages (from google-ai-generativelanguage) (2.14.1)
Requirement already satisfied: proto-plus<2.0.0,>=1.22.3 in /usr/local/lib/python3.11/dist-packages (from google-ai-generativelanguage) (1.24.1)
Requirement already satisfied: protobuf!=4.21.0,!4.21.1,!4.21.2,!4.21.3,!4.21.4,!4.21.5,<7.0.0,>=3.20.2 in /usr/local/lib/python3.11/dist-packages (from google-ai-generativelanguage) (4.21.5)
Requirement already satisfied: langsmith<0.4,>=0.1.126 in /usr/local/lib/python3.11/dist-packages (from langchain-core<0.4.0,>=0.3.62) (0.1.126)
Requirement already satisfied: tenacity!=8.4.0,<10.0.0,>=8.1.0 in /usr/local/lib/python3.11/dist-packages (from langchain-core<0.4.0,>=0.3.62) (8.5.0)
Requirement already satisfied: jsonpatch<2.0,>=1.33 in /usr/local/lib/python3.11/dist-packages (from langchain-core<0.4.0,>=0.3.62) (1.33)
Requirement already satisfied: PyYAML>=5.3 in /usr/local/lib/python3.11/dist-packages (from langchain-core<0.4.0,>=0.3.62) (6.0.1)
Requirement already satisfied: packaging<25,>=23.2 in /usr/local/lib/python3.11/dist-packages (from langchain-core<0.4.0,>=0.3.62) (23.2)
Requirement already satisfied: typing-extensions>=4.7 in /usr/local/lib/python3.11/dist-packages (from langchain-core<0.4.0,>=0.3.62) (4.7.1)
Requirement already satisfied: annotated-types>=0.6.0 in /usr/local/lib/python3.11/dist-packages (from pydantic<3,>=2) (0.6.0)
Requirement already satisfied: pydantic-core==2.33.2 in /usr/local/lib/python3.11/dist-packages (from pydantic<3,>=2) (2.33.2)
Requirement already satisfied: typing-inspection>=0.4.0 in /usr/local/lib/python3.11/dist-packages (from pydantic<3,>=2) (0.4.0)
Requirement already satisfied: googleapis-common-protos<2.0.0,>=1.56.2 in /usr/local/lib/python3.11/dist-packages (from google-api-core!=2.0.*,!=2.1.*,!=2.2.*,!=2.3.*,!=2.4.*,!=2.5.*,!=2.6.*,!=2.7.*,!=2.8.*,!=2.9.*) (1.56.2)
Requirement already satisfied: requests<3.0.0,>=2.18.0 in /usr/local/lib/python3.11/dist-packages (from google-api-core!=2.0.*,!=2.1.*,!=2.2.*,!=2.3.*,!=2.4.*,!=2.5.*,!=2.6.*,!=2.7.*,!=2.8.*,!=2.9.*) (2.18.0)
Requirement already satisfied: grpcio<2.0dev,>=1.33.2 in /usr/local/lib/python3.11/dist-packages (from google-api-core[grpc]!=2.0.*,!=2.1.*,!=2.2.*,!=2.3.*,!=2.4.*,!=2.5.*,!=2.6.*,!=2.7.*,!=2.8.*,!=2.9.*) (1.33.2)
Requirement already satisfied: grpcio-status<2.0.dev0,>=1.33.2 in /usr/local/lib/python3.11/dist-packages (from google-api-core[grpc]!=2.0.*,!=2.1.*,!=2.2.*,!=2.3.*,!=2.4.*,!=2.5.*,!=2.6.*,!=2.7.*,!=2.8.*,!=2.9.*) (1.33.2)
Requirement already satisfied: cachetools<6.0,>=2.0.0 in /usr/local/lib/python3.11/dist-packages (from google-auth!=2.24.0,!2.25.0,<3.0.0,>=3.1.4 in /usr/local/lib/python3.11/dist-packages (from google-auth!=2.24.0,!2.25.0,<3.0.0,>=3.1.4) (5.5.1)
Requirement already satisfied: pyasn1-modules>=0.2.1 in /usr/local/lib/python3.11/dist-packages (from google-auth!=2.24.0,!2.25.0,<3.0.0,>=3.1.4) (0.3.1)
Requirement already satisfied: rsa<5,>=3.1.4 in /usr/local/lib/python3.11/dist-packages (from google-auth!=2.24.0,!2.25.0,<3.0.0,>=3.1.4) (4.9.1)
Requirement already satisfied: jsonpointer>=1.9 in /usr/local/lib/python3.11/dist-packages (from jsonpatch<2.0,>=1.33) (2.0)
Requirement already satisfied: httpx<1,>=0.23.0 in /usr/local/lib/python3.11/dist-packages (from langsmith<0.4,>=0.1.126) (0.23.0)
Requirement already satisfied: orjson<4.0.0,>=3.9.14 in /usr/local/lib/python3.11/dist-packages (from langsmith<0.4,>=0.1.126) (3.9.14)
Requirement already satisfied: requests-toolbelt<2.0.0,>=1.0.0 in /usr/local/lib/python3.11/dist-packages (from langsmith<0.4,>=0.1.126) (1.0.0)
Requirement already satisfied: zstandard<0.24.0,>=0.23.0 in /usr/local/lib/python3.11/dist-packages (from langsmith<0.4,>=0.1.126) (0.23.0)
Requirement already satisfied: anyio in /usr/local/lib/python3.11/dist-packages (from httpx<1,>=0.23.0) (3.7.1)
Requirement already satisfied: certifi in /usr/local/lib/python3.11/dist-packages (from httpx<1,>=0.23.0) (2025.6.11)
Requirement already satisfied: httpcore==1.* in /usr/local/lib/python3.11/dist-packages (from httpx<1,>=0.23.0) (1.0.5)
Requirement already satisfied: idna in /usr/local/lib/python3.11/dist-packages (from httpx<1,>=0.23.0) (3.10)
Requirement already satisfied: h11>=0.16 in /usr/local/lib/python3.11/dist-packages (from httpcore==1.*) (0.14.0)
Requirement already satisfied: pyasn1<0.7.0,>=0.6.1 in /usr/local/lib/python3.11/dist-packages (from pyasn1-modules>=0.2.1) (0.6.1)
Requirement already satisfied: charset-normalizer<4,>=2 in /usr/local/lib/python3.11/dist-packages (from requests<3.0.0,>=2.18.0) (3.4.0)
Requirement already satisfied: urllib3<3,>=1.21.1 in /usr/local/lib/python3.11/dist-packages (from requests<3.0.0,>=2.18.0) (2.2.3)
Requirement already satisfied: sniffio>=1.1 in /usr/local/lib/python3.11/dist-packages (from anyio) (1.3.1)
Using cached google_ai_generativelanguage-0.6.18-py3-none-any.whl (1.4 MB)
Installing collected packages: google-ai-generativelanguage
  Attempting uninstall: google-ai-generativelanguage
    Found existing installation: google-ai-generativelanguage 0.6.15
    Uninstalling google-ai-generativelanguage-0.6.15:
      Successfully uninstalled google-ai-generativelanguage-0.6.15
ERROR: pip's dependency resolver does not currently take into account all the packages that are installed. This behaviour is the source of the following dependency conflicts.
google-generativeai 0.8.5 requires google-ai-generativelanguage==0.6.15, but you have google-ai-generativelanguage 0.6.18 which is incompatible.
Successfully installed google-ai-generativelanguage-0.6.18
```

```
import openai
import os
from openai import OpenAI
import PyPDF2
import re
import langchain
from langchain.prompts import PromptTemplate
from langchain.chains import LLMChain
from langchain_google_genai import ChatGoogleGenerativeAI
import seaborn as sns
import matplotlib.pyplot as plt
from langchain.text_splitter import RecursiveCharacterTextSplitter
from google.colab import userdata
from sklearn.ensemble import RandomForestClassifier
from sklearn.model_selection import train_test_split, GridSearchCV
from sklearn.metrics import accuracy_score, f1_score, confusion_matrix
from langchain_community.tools.tavily_search import TavilySearchResults
from langchain_tavily import TavilySearch
from dotenv import load_dotenv
load_dotenv()
# Initialize OpenAI client
os.environ["GOOGLE_API_KEY"] = userdata.get('GOOGLE_API_KEY_1')
os.environ["TAVILY_API_KEY"] = userdata.get('TAVILY_KEY')
import nltk
from nltk.corpus import stopwords
from nltk.tokenize import word_tokenize
nltk.download('stopwords')
nltk.download('punkt_tab')
nltk.download('punkt')
nltk.download('wordnet')
from nltk.corpus import stopwords
from nltk.stem import WordNetLemmatizer
```

```

[↗] [nltk_data] Downloading package stopwords to /root/nltk_data...
[nltk_data] Unzipping corpora/stopwords.zip.
[nltk_data] Downloading package punkt_tab to /root/nltk_data...
[nltk_data] Unzipping tokenizers/punkt_tab.zip.
[nltk_data] Downloading package punkt to /root/nltk_data...
[nltk_data] Unzipping tokenizers/punkt.zip.
[nltk_data] Downloading package wordnet to /root/nltk_data...

```

```

import pydantic
import json
import faiss
from pydantic import BaseModel, Field
from langchain_core.tools import tool
from langgraph.graph import StateGraph, START, END
from langgraph.graph.message import add_messages
from langgraph.prebuilt import ToolNode, tools_condition
from langchain_openai import ChatOpenAI
from langchain.document_loaders import PyPDFLoader
from langchain.text_splitter import RecursiveCharacterTextSplitter
from langchain_openai import OpenAIEmbeddings
from langchain_core.messages import BaseMessage
from typing import Annotated, Any
from typing_extensions import TypedDict
from langchain.vectorstores import FAISS

llm = ChatGoogleGenerativeAI(model="gemini-1.5-pro", temperature=0)
tavily = TavilySearch(max_results=5, search_depth="advanced", format="json")

# Set up the API wrapper

import serpapi
tools = [tavily]
from langchain_core.messages import AIMessage, ToolMessage
llm_with_tools=llm.bind_tools(tools=tools)
class Researchpaper(TypedDict):
    messages: Annotated[list, add_messages]
    paper_content: str

    search_results: list
    scores: dict
    red_result : str
graph_builder = StateGraph(Researchpaper)

def parse_scores(response: str) -> dict:
    scores = dict(line.split(": ") for line in response.strip().splitlines())
    scores = {k: float(v) for k, v in scores.items()}
    return scores

def initial_analysis(paper: Researchpaper) -> Researchpaper:
    #initiate search queries
    messages = [
        {"role": "system", "content": """Analyze the research paper and generate search queries to:
        1. Find similar papers for methodology verification
        2. Find cited references for fact-checking
        3. Find competing approaches for comparison"""},
        {"role": "user", "content": paper["paper_content"]}
    ]
    response = llm_with_tools.invoke(messages)
    print(response)

# Extract queries

paper["messages"] = response

return paper

def process_results(paper: Researchpaper) -> Researchpaper:

    last_tool_message = paper["messages"][-1]
    print(last_tool_message)

    # Extract from ToolMessage content (not tool_calls)
    if isinstance(last_tool_message, ToolMessage):
        # Tavily results are already in message content
        search_results = last_tool_message.content
        paper["search_results"] = json.loads(search_results)
    else:
        print("Unexpected message type:", type(last_tool_message))
    return paper

```



```

def finalscore(state:Researchpaper)->Researchpaper:

    analysis_prompt = [
        {"role":"system", "content":f"""\nAnalyze the paper using these steps:
        1. Cross-verify methodology with {state["search_results"]}
        2. Check factual claims against found references
        3. Compare results with similar papers
        4. Score each category (0-10) with explanations
        5. all of these parameters methodology, technical soundness, factual correctness, rigourousity, novelty, results, clarity, and et
        should be on a 0-10 scale
        6. total should be sum of the values of all the parameters and should be on a 0-80 scale
        7. the score should be floating point number rounded upto two decimal places.""",

        {"role":"user", "content":f'''\nPaper content:\n{state["paper_content"]}\n\nReferences:\n{state["search_results"]}

        This is the format you must follow for scoring:
        methodology: X
        technical_soundness: X
        factual_correctness: X
        rigourousity: X
        novelty: X
        results: X
        clarity: X
        ethics: X
        total : X

        Display only the scores in this format.'''}

    ]

    response = llm.invoke(analysis_prompt)
    print(response)
    return {"scores": parse_scores(response.content)}

graph_builder.add_node("analyze_paper",initial_analysis)
graph_builder.add_node("process_results", process_results)
graph_builder.add_node("tools", ToolNode([tavily]))

graph_builder.add_node("finalscore", finalscore)
graph_builder.set_entry_point("analyze_paper")
graph_builder.add_edge("analyze_paper", "tools")
graph_builder.add_edge("tools", "process_results")
graph_builder.add_edge("process_results", "finalscore")
graph_builder.add_edge("finalscore", END)
graph = graph_builder.compile()

from google.colab import drive
drive.mount('/content/drive')
!pip install gdown
!gdown --folder "https://drive.google.com/drive/folders/1-658SR6wI7EBthpHFJDHmJ_0iyaubU-f"

Mounted at /content/drive
Requirement already satisfied: gdown in /usr/local/lib/python3.11/dist-packages (5.2.0)
Requirement already satisfied: beautifulsoup4 in /usr/local/lib/python3.11/dist-packages (from gdown) (4.13.4)
Requirement already satisfied: filelock in /usr/local/lib/python3.11/dist-packages (from gdown) (3.18.0)
Requirement already satisfied: requests[socks] in /usr/local/lib/python3.11/dist-packages (from gdown) (2.32.3)
Requirement already satisfied: tqdm in /usr/local/lib/python3.11/dist-packages (from gdown) (4.67.1)
Requirement already satisfied: soupsieve>1.2 in /usr/local/lib/python3.11/dist-packages (from beautifulsoup4->gdown) (2.7)
Requirement already satisfied: typing-extensions>=4.0.0 in /usr/local/lib/python3.11/dist-packages (from beautifulsoup4->gdown) (4)
Requirement already satisfied: charset-normalizer<4,>=2 in /usr/local/lib/python3.11/dist-packages (from requests[socks]->gdown) (
Requirement already satisfied: idna<4,>=2.5 in /usr/local/lib/python3.11/dist-packages (from requests[socks]->gdown) (3.10)
Requirement already satisfied: urllib3<3,>=1.21.1 in /usr/local/lib/python3.11/dist-packages (from requests[socks]->gdown) (2.4.0)
Requirement already satisfied: certifi>=2017.4.17 in /usr/local/lib/python3.11/dist-packages (from requests[socks]->gdown) (2025.4
Requirement already satisfied: PySocks!=1.5.7,>=1.5.6 in /usr/local/lib/python3.11/dist-packages (from requests[socks]->gdown) (1.
Retrieving folder contents
Retrieving folder 1_xFmMlRNDR0wzzPsv6wXXdGz0eX6vaYb Non-Publishable
Processing file 1b3FQMAZ7tDCgIPU8g6u2TaSH8JH_b0 R001.pdf
Processing file 1yt6A1YliB1Tst7oYkRn6ZotDFWe0Rkpf R002.pdf
Processing file 1KXgZegG-3rPcK37Ua1P0Ippu_yWvkgYU R003.pdf
Processing file 1lZ-AN06L-D9cyZfNqOiH2PKH80hDLCKI R004.pdf
Processing file 1H0HRA1VXVIJshvr64bX0buRitD2HbPsi R005.pdf
Retrieving folder 1RKYDkAyW7cf09THED7Ms4LNBdeTDWn1K Publishable
Retrieving folder 1RifJJBjm5tA8E20808RjvKIAiWnFbceb CVPR
Processing file 1qpRfsgGy-m2iq_WT71H9C60gzE30ESC R006.pdf
Processing file 1iggcvhmWBvHdUuTH6LR3HnMcGsGGxBfY R007.pdf
Retrieving folder 1JVzabziJf4d2drCTXfssFr_wzMnJR8oT EMNLP
Processing file 1dlzAYEqKrlJqYkVRkandoyYfPA7bE1V R008.pdf
Processing file 1XGrMuvDuK3HHgamNF8kN3lSild12j7aP R009.pdf
Retrieving folder 1sJKv0o5ySrigZewU_wtTxysx9j0k0_nV KDD
Processing file 1GxI_lyX0Fps3CGh6qvWBMowgqbzn5p2A R010.pdf
Processing file 1AqXTZvXfCtWaoW_8iW3Jsgqy3CoyJ5e R011.pdf
Retrieving folder 1ZgkbpvhoNkUuH0b4uCV30lyWg3-5ijTC NeurIPS
Processing file 1G-Te2p5gGJHxDSNFYA0Xpr5H1hplqyx1 R012.pdf
Processing file 1f7BCC4M8QJqhdabHCze19EvSXqY4Pvj R013.pdf
Retrieving folder 13eDgt0YghQU2qlogGrTrXJzfD0h0F2Iw TMLR
Processing file 1C0phhBTWa5VJbw_uqWnv8CB2ubtjHGB1 R014.pdf
Processing file 1G7L_cjQO_alpQljsvXQ6H_BND9i_rRqP R015.pdf

```

```

Retrieving folder contents completed
Building directory structure
Building directory structure completed
Downloading...
From: https://drive.google.com/uc?id=1b3FQMAZ7tDCgIPUH8g6u2TaSH8JH\_b0
To: /content/Reference/Non-Publishable/R001.pdf
100% 92.3k/92.3k [00:00<00:00, 50.9MB/s]
Downloading...
From: https://drive.google.com/uc?id=1yt6A1YliB1Tst7oYkRn6ZotDFwe0Rkpf
To: /content/Reference/Non-Publishable/R002.pdf
100% 89.5k/89.5k [00:00<00:00, 79.4MB/s]
Downloading...
From: https://drive.google.com/uc?id=1KXgZegG-3rPCk37Ua1P0Ipnju\_yWvkgYU
To: /content/Reference/Non-Publishable/R003.pdf
100% 90.7k/90.7k [00:00<00:00, 72.4MB/s]
Downloading...
From: https://drive.google.com/uc?id=11Z-AN06L-D9cyZfNgQiH2PKH80hDLCKI
To: /content/Reference/Non-Publishable/R004.pdf
100% 62.5k/62.5k [00:00<00:00, 19.8MB/s]
Downloading...
From: https://drive.google.com/uc?id=1H0HRA1VXVIJshvr64bXObuRitD2HpBsi

```

```

import numpy as np
def conference_teller(fname):
    if(fname=="R006.pdf" or fname=="R007.pdf"):return "CVPR"
    elif (fname=="R008.pdf"or fname=="R009.pdf"):return"EMNLP"
    elif (fname=="R010.pdf"or fname=="R011.pdf"):return"KDD"
    elif (fname=="R012.pdf"or fname=="R013.pdf"):return"NeurIPS"
    else: return "TMLR"
splitter = RecursiveCharacterTextSplitter(chunk_size=1000, chunk_overlap=50)
all_chunks = []
dicd = []
for i in range(1,16):
    docs1= " "
    if(i>=1 and i<=5):
        base_dir = "/content/Reference/Non-Publishable"
    else:
        base_dir = "/content/Reference/Publishable"
    fname = f"R{i:03}.pdf"
    if(i>=1 and i<=5):
        file_path = os.path.join(base_dir,fname)
    if(i>=6 and i<=15):
        conference = conference_teller(fname)
        file_path = os.path.join(base_dir, conference, fname)
    loader = PyPDFLoader(file_path)
    docs = loader.load()
    for doc in docs:
        docs1 = docs1 + doc.page_content
        fname = f"R{i:03}.pdf"
        doc.metadata["source_file"] = fname
        if(i>=6 and i<=15):
            doc.metadata["conference"] = conference_teller(fname)
    if(i>=6 and i<=15):
        chunks = splitter.split_documents(docs)
        all_chunks.extend(chunks)
    inputs = {
        "messages": [],
        "paper_content": docs1,
        "search_results": [],
        "scores": {},
        "red_result": " "
    }
    final_output = None

# Run the graph step by step
for step in graph.stream({
    "messages": [],
    "paper_content": docs1,
    "search_results": [],
    "scores": {},
    "red_result": " "
}): print(step)

dicd.append(step['finalscore']["scores"])

```

```

content='' additional_kwargs={'function_call': {'name': 'tavily_search', 'arguments': '{"search_depth": "advanced", "query": "alte
{"analyze_paper": {'messages': AIMessage(content='', additional_kwargs={'function_call': {'name': 'tavily_search', 'arguments': '{
{'tools': {'messages': [ToolMessage(content='{"query": "graphite material properties research", "follow_up_questions": null, "answ
content='{"query": "alternative materials to graphite applications", "follow_up_questions": null, "answer": null, "images": [], "r
{'process_results': {'messages': [AIMessage(content='', additional_kwargs={'function_call': {'name': 'tavily_search', 'arguments':
content='methodology: 0.0\ntechnical_soundness: 0.0\nfactual_correctness: 0.0\nrigorosity: 0.0\nnovelty: 1.0\nresults: 0.0\nclari
{'finalscore': {'scores': {'methodology': 0.0, 'technical_soundness': 0.0, 'factual_correctness': 0.0, 'rigorosity': 0.0, 'novelt
content='' additional_kwargs={'function_call': {'name': 'tavily_search', 'arguments': '{"query": "photosynthesis fractal geometry
{'analyze_paper': {'messages': AIMessage(content='', additional_kwargs={'function_call': {'name': 'tavily_search', 'arguments': '{
{'tools': {'messages': [ToolMessage(content='{"query": "photosynthesis methodology spectroscopic analysis", "follow_up_questions":

```

```

content={'query': "photosynthesis fractal geometry leaf morphology", "follow_up_questions": null, "answer": null, "images": [], "
{'process_results': {'messages': [AIMessage(content='', additional_kwargs={'function_call': {'name': 'tavily_search', 'arguments':
content='methodology: 1\ntechnical_soundness: 0\nfactual_correctness: 0\nrigorosity: 0\nnovelty: 0\nresults: 0\nclarity: 1\nethic
{'finalscore': {'scores': {'methodology': 1.0, 'technical_soundness': 0.0, 'factual_correctness': 0.0, 'rigorosity': 0.0, 'novelt
content='' additional_kwargs={'function_call': {'name': 'tavily_search', 'arguments': '{"query": "metal phase transitions thermody
{'analyze_paper': {'messages': AIMessage(content='', additional_kwargs={'function_call': {'name': 'tavily_search', 'arguments': '{
{'tools': {'messages': [ToolMessage(content='{"query": "metal properties study methodology verification", "follow_up_questions": n
content='{"query": "metal phase transitions thermodynamics", "follow_up_questions": null, "answer": null, "images": [], "results":
{'process_results': {'messages': [AIMessage(content='', additional_kwargs={'function_call': {'name': 'tavily_search', 'arguments':
content='methodology: 0.0\ntechnical_soundness: 0.0\nfactual_correctness: 0.0\nrigorosity: 0.0\nnovelty: 0.0\nresults: 0.0\nclari
{'finalscore': {'scores': {'methodology': 0.0, 'technical_soundness': 0.0, 'factual_correctness': 0.0, 'rigorosity': 0.0, 'novelt
content='' additional_kwargs={'function_call': {'name': 'tavily_search', 'arguments': '{"search_depth": "advanced", "query": "clas
{'analyze_paper': {'messages': AIMessage(content='', additional_kwargs={'function_call': {'name': 'tavily_search', 'arguments': '{
{'tools': {'messages': [ToolMessage(content='{"query": "adaptive learning systems personalization education", "follow_up_questions
content='{"query": "classical music biopolymer properties", "follow_up_questions": null, "answer": null, "images": [], "results":
{'process_results': {'messages': [AIMessage(content='', additional_kwargs={'function_call': {'name': 'tavily_search', 'arguments':
content='methodology: 2\ntechnical_soundness: 1\nfactual_correctness: 1\nrigorosity: 1\nnovelty: 2\nresults: 1\nclarity: 7\nethic
{'finalscore': {'scores': {'methodology': 2.0, 'technical_soundness': 1.0, 'factual_correctness': 1.0, 'rigorosity': 1.0, 'novelt
content='' additional_kwargs={'function_call': {'name': 'tavily_search', 'arguments': '{"search_depth": "advanced", "query": "cult
{'analyze_paper': {'messages': AIMessage(content='', additional_kwargs={'function_call': {'name': 'tavily_search', 'arguments': '{
{'tools': {'messages': [ToolMessage(content='{"query": "LSTM-based gesture recognition", "follow_up_questions": null, "answer": nu
content='{"query": "cultural and therapeutic benefits of flamenco dance", "follow_up_questions": null, "answer": null, "images": [
{'process_results': {'messages': [AIMessage(content='', additional_kwargs={'function_call': {'name': 'tavily_search', 'arguments':
content='methodology: 6\ntechnical_soundness: 4\nfactual_correctness: 3\nrigorosity: 3\nnovelty: 5\nresults: 4\nclarity: 7\nethic
{'finalscore': {'scores': {'methodology': 6.0, 'technical_soundness': 4.0, 'factual_correctness': 3.0, 'rigorosity': 3.0, 'novelt
content='' additional_kwargs={'function_call': {'name': 'tavily_search', 'arguments': '{"query": "InceptionV3"}}} response_metada
{'analyze_paper': {'messages': AIMessage(content='', additional_kwargs={'function_call': {'name': 'tavily_search', 'arguments': '{
{'tools': {'messages': [ToolMessage(content='{"query": "fine-grained activity recognition in sports videos", "follow_up_questions
content='{"query": "InceptionV3", "follow_up_questions": null, "answer": null, "images": [], "results": [{"title": "Inception V2 a
{'process_results': {'messages': [AIMessage(content='', additional_kwargs={'function_call': {'name': 'tavily_search', 'arguments':
content='methodology: 8\ntechnical_soundness: 7\nfactual_correctness: 8\nrigorosity: 7\nnovelty: 6\nresults: 7\nclarity: 8\nethic
{'finalscore': {'scores': {'methodology': 8.0, 'technical_soundness': 7.0, 'factual_correctness': 8.0, 'rigorosity': 7.0, 'novelt
content='' additional_kwargs={'function_call': {'name': 'tavily_search', 'arguments': '{"search_depth": "advanced", "query": "Ener
{'analyze_paper': {'messages': AIMessage(content='', additional_kwargs={'function_call': {'name': 'tavily_search', 'arguments': '{
{'tools': {'messages': [ToolMessage(content='{"query": "3D food reconstruction from images", "follow_up_questions": null, "answer"
content='{"query": "Energy Distribution Map food images", "follow_up_questions": null, "answer": null, "images": [], "results": [{
{'process_results': {'messages': [AIMessage(content='', additional_kwargs={'function_call': {'name': 'tavily_search', 'arguments':
content='methodology: 8\ntechnical_soundness: 7\nfactual_correctness: 7\nrigorosity: 6\nnovelty: 6\nresults: 7\nclarity: 8\nethic
{'finalscore': {'scores': {'methodology': 8.0, 'technical_soundness': 7.0, 'factual_correctness': 7.0, 'rigorosity': 6.0, 'novelt
content='' additional_kwargs={'function_call': {'name': 'tavily_search', 'arguments': '{"query": "\"Pan and Yang 2010\" Transfer
{'analyze_paper': {'messages': AIMessage(content='', additional_kwargs={'function_call': {'name': 'tavily_search', 'arguments': '{
{'tools': {'messages': [ToolMessage(content='{"query": "Noun-Noun Compound Interpretation Transfer Learning Multi-task Learning",
content='{"query": "\"Pan and Yang 2010\" Transfer Learning Multi-task Learning", "follow_up_questions": null, "answer": null, "
{'process_results': {'messages': [AIMessage(content='', additional_kwargs={'function_call': {'name': 'tavily_search', 'arguments':
content='methodology: 7\ntechnical_soundness: 6\nfactual_correctness: 7\nrigorosity: 6\nnovelty: 5\nresults: 6\nclarity: 8\nethic
{'finalscore': {'scores': {'methodology': 7.0, 'technical_soundness': 6.0, 'factual_correctness': 7.0, 'rigorosity': 6.0, 'novelt
content='' additional_kwargs={'function_call': {'name': 'tavily_search', 'arguments': '{"search_depth": "advanced", "query": "argu

```

```

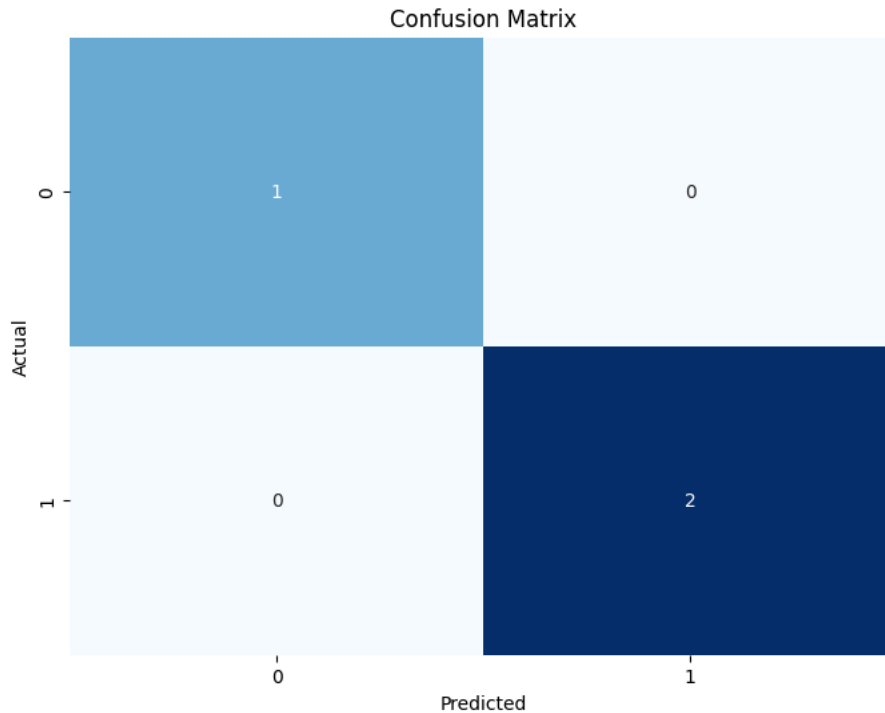
data = np.array([[dic['methodology'], dic['technical_soundness'], dic['factual_correctness'], dic['rigorosity'], dic['novelty']
                    , dic['results'], dic['clarity'], dic['ethics'], dic['total']] for dic in dics])
label = np.array([0,0,0,0,0,1,1,1,1,1,1,1,1,1,1])
X_train, X_test, y_train, y_test = train_test_split(data, label, test_size=0.2, random_state=42)
rf_classifier = RandomForestClassifier(n_estimators=100, random_state=42)
rf_classifier.fit(X_train, y_train)
y_pred = rf_classifier.predict(X_test)
print(y_pred)
accuracy = accuracy_score(y_test, y_pred)
F1_score = f1_score(y_test, y_pred)
cm = confusion_matrix(y_test, y_pred)
print(F1_score)
print(accuracy)
print(cm)
plt.figure(figsize=(8, 6))
sns.heatmap(cm, annot=True, fmt='d', cmap='Blues', cbar=False)
plt.xlabel('Predicted')
plt.ylabel('Actual')
plt.title('Confusion Matrix')
plt.show()

```

```

[1 1 0]
1.0
1.0
[[1 0]
 [0 2]]

```



```

from sklearn.naive_bayes import GaussianNB
model = GaussianNB()
model.fit(X_train, y_train)
from sklearn.metrics import accuracy_score, classification_report
y_pred = model.predict(X_test)
print("Accuracy:", accuracy_score(y_test, y_pred))
print(classification_report(y_test, y_pred))

```

```

Accuracy: 1.0

```

	precision	recall	f1-score	support
0	1.00	1.00	1.00	1
1	1.00	1.00	1.00	2
accuracy			1.00	3
macro avg	1.00	1.00	1.00	3
weighted avg	1.00	1.00	1.00	3

```

import xml.etree.ElementTree as ET
def xml_to_readable_string(xml_data):
    xml_data = xml_data.strip() # Remove leading/trailing whitespace

    # Handle potential Byte Order Mark (BOM) if present
    if xml_data.startswith('\u00ff'):
        xml_data = xml_data[1:]

    try:
        root = ET.fromstring(xml_data)
    except ET.ParseError as e:
        # If basic cleaning doesn't work, try more aggressive cleaning
        xml_data = xml_data.replace('\n', ' ').replace('\t', ' ').replace('\r', ' ')
        xml_data = ' '.join(xml_data.split()) # Collapse multiple spaces
        root = ET.fromstring(xml_data)

    # Define namespaces
    ns = {
        'atom': 'http://www.w3.org/2005/Atom',
        'arxiv': 'http://arxiv.org/schemas/atom',
        'opensearch': 'http://a9.com/-/spec/opensearch/1.1/'
    }

    # Initialize result string
    result = []

    # Add search metadata
    result.append("=== ARXIV SEARCH RESULTS ===")
    result.append(f"Query: {query.strip().replace(' ', '+')}")

```

```

result.append(f"Query: {root.find('atom:title', ns).text}")
result.append(f"Total Results: {root.find('opensearch:totalResults', ns).text}")
result.append(f"Showing: {root.find('opensearch:itemsPerPage', ns).text} of {root.find('opensearch:totalResults', ns).text}")
result.append("\n")

# Process each entry
for entry in root.findall('atom:entry', ns):
    # Basic info
    result.append(f"Title: {entry.find('atom:title', ns).text.strip()}")
    result.append(f"Authors: {' '.join([a.find('atom:name', ns).text for a in entry.findall('atom:author', ns)])}")
    result.append(f"Published: {entry.find('atom:published', ns).text}")
    result.append(f"Updated: {entry.find('atom:updated', ns).text}")

    # Links
    pdf_link = [link.get('href') for link in entry.findall('atom:link', ns)
                 if link.get('type') == 'application/pdf'][0]
    result.append(f"PDF: {pdf_link}")

    # Abstract
    abstract = entry.find('atom:summary', ns).text.strip()
    result.append(f"\nAbstract:\n{abstract}\n")

    # Categories
    categories = [cat.get('term') for cat in entry.findall('atom:category', ns)]
    result.append(f"Categories: {' '.join(categories)}\n")

    result.append("=*50 + "\n")

return '\n'.join(result)

def extract_url(xml):
    import xml.etree.ElementTree as ET
    feed = ET.fromstring(xml) # Replace xml_content with your XML string
    # Namespace handling (required for Atom feeds)
    ns = {'atom': 'http://www.w3.org/2005/Atom'}
    # Extract PDF URLs
    pdf_urls = []
    for entry in feed.findall('atom:entry', ns):
        for link in entry.findall('atom:link', ns):
            if link.get('title') == 'pdf' and link.get('rel') == 'related':
                pdf_urls.append(link.get('href'))
    return pdf_urls

def extract_rel(xml):
    import xml.etree.ElementTree as ET
    # Load your XML content here
    tree = ET.fromstring(xml)
    titless = []
    abs=[]
    cats = []
    # Namespace for arXiv Atom feed
    ns = {'atom': 'http://www.w3.org/2005/Atom'}
    # Iterate through each entry in the feed
    for entry in tree.findall('atom:entry', ns):
        title = entry.find('atom:title', ns).text.strip()
        abstract = entry.find('atom:summary', ns).text.strip()

        # The 'category' element has an attribute 'term'
        category_elem = entry.find('atom:category', ns)
        category_term = category_elem.attrib['term'] if category_elem is not None else 'N/A'
        titless.append(title)
        abs.append(abstract)
        cats.append(category_term)
    return (titless,abs,cats)

def clean_research_paper(text):

    # Remove References (case-insensitive)
    text = re.sub(r'(?i)\breferences\b.*', '', text, flags=re.DOTALL)

    # Remove Appendix (case-insensitive)
    text = re.sub(r'(?i)\bappendix\b.*', '', text, flags=re.DOTALL)

    # Remove Conclusion (case-insensitive)
    text = re.sub(r'(?i)\bconclusion\b.*', '', text, flags=re.DOTALL)
    text = re.sub(r'(?i)\bconclusions\b.*', '', text, flags=re.DOTALL)
    # Remove Acknowledgements (optional)
    text = re.sub(r'(?i)\backnowledgements\b.*', '', text, flags=re.DOTALL)

    # Remove multiple newlines and extra spaces
    text = re.sub(r'\n\s*\n', '\n\n', text)

```



```

    return text

def complete_operation(pdf_url, ctext):
    import requests
    from pathlib import Path
    docs = []
    i = 1
    from sklearn.feature_extraction.text import TfidfVectorizer
    from sklearn.metrics.pairwise import cosine_similarity
    def preprocess(text):
        # Lowercase + remove special chars
        text = re.sub(r'^a-zA-Z\s', '', text.lower())

        # Remove stopwords
        stop_words = set(stopwords.words('english'))
        words = text.split()
        words = [w for w in words if w not in stop_words]

        # Lemmatization
        lemmatizer = WordNetLemmatizer()
        words = [lemmatizer.lemmatize(w) for w in words]

        return " ".join(words)

    vectorizer = TfidfVectorizer()
    for url in pdf_url:
        text = ""
        try:
            response = requests.get(url)
            response.raise_for_status() # Raises HTTPError for bad status
        except requests.HTTPError as e:
            print(f"Skipping {url}: {e}")
            continue # Check for HTTP errors
        filename = Path(url).name + ".pdf" # e.g., "1710.02318v1.pdf"
        with open(filename, "wb") as f:
            f.write(response.content)
        with open(filename, "rb") as f:
            reader = PyPDF2.PdfReader(f)
            for page in reader.pages:
                page_text = page.extract_text()
                if page_text:
                    # Clean the text (remove page numbers at the end)
                    page_text = re.sub(r'\s*\d+\s*$', ' ', page_text)
                    text += page_text + "\n" # Add a newline between pages
            text = clean_research_paper(text)
            docs.append(text)

    processed1 = preprocess(ctext)
    process = []
    for doc in docs:
        proc = {}
        processed2 = preprocess(doc)
        tfidf_matrix = vectorizer.fit_transform([processed1, processed2])
        similarity = cosine_similarity(tfidf_matrix[0], tfidf_matrix[1])[0][0]
        print(f"Cosine Similarity: {similarity:.2f}")
        proc['similarity_score'] = similarity

        process.append(proc)
    return process

def extract_title(text):
    # Match text before "Abstract", allowing for line breaks
    match = re.search(r'^(\.?)*\bAbstract\b', text, re.DOTALL | re.IGNORECASE)
    if match:
        # Clean up: remove extra whitespace and join lines
        title = ' '.join(match.group(1).split()).strip()
        return title
    return None

def arxiv_query_url_from_title(title: str, max_results: int = 5, search_field: str = "all") -> str:
    encoded_title = urllib.parse.quote_plus(title.strip())
    base_url = "http://export.arxiv.org/api/query"
    query = f"{base_url}?search_query={search_field}:{encoded_title}&max_results={max_results}"
    return query

import urllib, urllib.request
from langchain_google_genai import GoogleGenerativeAIEmbeddings
import re # Import the re module

# Use your already-configured GOOGLE_API_KEY (env or secret manager)
embedding = GoogleGenerativeAIEmbeddings(
    model="models/embedding-001", # or "text-embedding-004"
    task_type="RETRIEVAL_DOCUMENT" # or "RETRIEVAL_QUERY"
)

```

```

)
dim = 1536
vectorstore = FAISS.from_documents(all_chunks, embedding,distance_strategy="DOT_PRODUCT")
vectorstore.save_local("/content/faiss_index")
vectorstore = FAISS.load_local("/content/faiss_index", embedding,allow_dangerous_deserialization=True)
retriever = vectorstore.as_retriever(search_type="similarity", k=3)
class ResearchPaper(TypedDict):
    messages: str
    arxiv_results : list
    reason: str
    retrieved_docs: list
    conference:str
def retrieve_step(state):
    query = state["messages"]
    # Clean the query string
    query = re.sub(r'\s+', ' ', query).strip() # Replace multiple whitespace with single space and strip
    query = re.sub(r'^\x00-\x7F|+', '', query) # Remove non-ASCII characters
    query = clean_research_paper(query)
    docs = retriever.invoke(query)
    state["retrieved_docs"] = docs
    return state

def result_fetching(state):
    docs = state['messages']
    title = extract_title(docs)

    url = arxiv_query_url_from_title(title, max_results=5, search_field="all")
    data = urllib.request.urlopen(url)
    yml1 = data.read().decode('utf-8')

    pdf_url = extract_url(yml1)
    titles,abs,cats = extract_rel(yml1)
    process = complete_operation(pdf_url,docs)
    for proc,tit,abs,cat in zip(process,titles,abs,cats):
        proc['title'] = tit
        proc['abstract'] = abs
        proc['category'] = cat
    state["arxiv_results"] = process
    return state
def llms(state):
    docs = state["retrieved_docs"]
    docss = state["arxiv_results"]
    system_msg = '''from the given information predict the conference out of TMLR,KDD,EMNLP,CVPR,NeurIPS and also give tell why this conf
'''
    user_msg = f'''first analyze {docs} and then analyze {docss} and then predict the conference .
display the name of the conference only.
'''
    response = llm.invoke([{"role": "system", "content": system_msg},
                           {"role": "user", "content": user_msg}])
    state["conference"] = response.content

    return state
graphs_builder = StateGraph(ResearchPaper)
graphs_builder.add_node("retrieve_step",retrieve_step)
graphs_builder.set_entry_point("retrieve_step")
graphs_builder.add_node("llms",llms)
graphs_builder.add_node("result_fetching",result_fetching)
graphs_builder.add_edge("retrieve_step","result_fetching")
graphs_builder.add_edge("result_fetching","llms")
graphs_builder.add_edge("llms", END)
graphs = graphs_builder.compile()

```

```
def get_reason_text(conf): # Renamed from reason
    if(conf=="CVPR"):
        dfg = '''focuses on computer vision tasks: image classification, object detection, segmentation, 3D reconstruction, video analysis,
        It proposes new vision models or datasets.It includes strong empirical results on vision benchmarks (like ImageNet, COCO, et
    elif(conf=="KDD"):
        dfg = '''It emphasizes data mining, large-scale data analysis, or real-world data applications.
        It often bridges theory and applied machine learning for massive datasets.
        Strong industrial or data-driven focus is common. '''
    elif(conf=="TMLR"):
        dfg = '''It is a general machine learning paper with strong theoretical or empirical contributions.'''
    elif(conf=="EMNLP"):
        dfg = '''It focuses on natural language processing: syntax, semantics, text generation, sentiment analysis, etc.
        It has strong empirical grounding (usually large-scale experiments on NLP tasks).
        Often includes new datasets, benchmarks, or language models. '''
    else :
        dfg = ''' It contributes to foundational machine learning, AI, or optimization.
        It can be theoretical or applied but must show novelty and general relevance.
        It may cross disciplines: neuroscience, cognitive science, economics, etc. '''
    return dfg
```

```
name=[]
conference = []
conference_reasons = [] # Renamed from reasons
for i in range(1,11):

    docs2=""
    base_dir = "/content"
    fname = f"P{i:03}.pdf"
    os.path.join(base_dir, fname)
    loader = PyPDFLoader(os.path.join(base_dir, fname))
    docs = loader.load()
    for doc in docs:
        docs2 = docs2 + doc.page_content
    for step in graph.stream({
        "messages": [],
        "paper_content": docs2,
        "search_results": [],
        "scores": {},
        "red_result": " "
    }) :
        print(step)
    div = step["finalscore"]["scores"]
    data = np.array([div['methodology'],div['technical_soundness'],div['factual_correctness'],div['rigorosity'],div['novelty'],
                    ,div['results'],div['clarity'],div['ethics'], div['total']] )
    rty = rf_classifier.predict([data])
    conference=[]
    name=[]
    conference_reasons=[] # Renamed from reasons
    if(rty==0):

        conf="NA"

        print(f"{fname} belongs to {conf}")
    else:

        dfg = graphs.invoke( {
            "messages": docs2,
            "arxiv_results": [ ],
            "imp_points": " ",
            "retrieved_docs": [],
            "conference": " "
        } )

        conf=dfg["conference"]

        conference_reasons.append(get_reason_text(conf)) # Updated function call
        print(f"{fname} belongs to {conf}")
```

```
content='' additional_kwargs={'function_call': {'name': 'tavily_search', 'arguments': '{"query": "Accuracy of LiDAR based drone de
{'analyze_paper': {'messages': AIMessage(content='', additional_kwargs={'function_call': {'name': 'tavily_search', 'arguments': '{
{'tools': {'messages': [ToolMessage(content='{"query": "LiDAR point cloud clustering for object detection", "follow_up_questions":
content='{"query": "Accuracy of LiDAR based drone detection", "follow_up_questions": null, "answer": null, "images": [], "results"
{'process_results': {'messages': [AIMessage(content='', additional_kwargs={'function_call': {'name': 'tavily_search', 'arguments':
content='methodology: 4\ntechnical_soundness: 3\nfactual_correctness: 6\nrigorosity: 2\nnovelty: 2\nresults: 2\nclarity: 6\nethic
{'finalscore': {'scores': {'methodology': 4.0, 'technical_soundness': 3.0, 'factual_correctness': 6.0, 'rigorosity': 2.0, 'novelt
P001.pdf belongs to NA
content='' additional_kwargs={'function_call': {'name': 'tavily_search', 'arguments': '{"query": "virus host interaction"}}} resp
{'analyze_paper': {'messages': AIMessage(content='', additional_kwargs={'function_call': {'name': 'tavily_search', 'arguments': '{
{'tools': {'messages': [ToolMessage(content='{"query": "virus transmission research methodology", "follow_up_questions": null, "an
```

```
for i in range(12,16):
```

https://colab.research.google.com/drive/139WhNNJESaVSIIlgqvcRLtd9KI9_XdNp#printMode=true

```
conf=dfg["conference"]
```

```
conference_reasons.append(get_reason_text(conf)) # Updated function call
print(f"{fname} belongs to {conf}")
```

```
→ content='' additional_kwargs={'function_call': {'name': 'tavily_search', 'arguments': '{"query": "Irreducible loss in language model"',
{'analyze_paper': {'messages': AIMessage(content='', additional_kwargs={'function_call': {'name': 'tavily_search', 'arguments': '{"c
{'tools': {'messages': [ToolMessage(content='{"query": "scaling laws for transformer language models", "follow_up_questions": null,
content='{"query": "Irreducible loss in language modeling", "follow_up_questions": null, "answer": null, "images": [], "results": [{
{'process_results': {'messages': [AIMessage(content='', additional_kwargs={'function_call': {'name': 'tavily_search', 'arguments':
content='methodology: 8\ntechnical_soundness: 7\nfactual_correctness: 7\nrigorosity: 7\nnovelty: 6\nresults: 7\nclarity: 8\nethics
{'finalscore': {'scores': {'methodology': 8.0, 'technical_soundness': 7.0, 'factual_correctness': 7.0, 'rigorosity': 7.0, 'novelty
Cosine Similarity: 0.59
Cosine Similarity: 0.38
Cosine Similarity: 0.43
Cosine Similarity: 0.22
Cosine Similarity: 0.36
P012.pdf belongs to EMNLP
content='' additional_kwargs={'function_call': {'name': 'tavily_search', 'arguments': '{"query": "\\\"Kindermans et al.\\\" \\\"Patterr
{'analyze_paper': {'messages': AIMessage(content='', additional_kwargs={'function_call': {'name': 'tavily_search', 'arguments': '{"c
{'tools': {'messages': [ToolMessage(content='{"query": "PatternAttribution neural network explanations", "follow_up_questions": null
content='{"query": "\\\"Kindermans et al.\\\" \\\"PatternNet\\\" \\\"PatternAttribution\\\""', "follow_up_questions": null, "answer": null,
{'process_results': {'messages': [AIMessage(content='', additional_kwargs={'function_call': {'name': 'tavily_search', 'arguments':
content='methodology: 6\ntechnical_soundness: 5\nfactual_correctness: 8\nrigorosity: 5\nnovelty: 7\nresults: 6\nclarity: 7\nethics
{'finalscore': {'scores': {'methodology': 6.0, 'technical_soundness': 5.0, 'factual_correctness': 8.0, 'rigorosity': 5.0, 'novelty
Cosine Similarity: 0.15
Cosine Similarity: 0.16
Cosine Similarity: 0.24
Cosine Similarity: 0.14
Cosine Similarity: 0.12
P013.pdf belongs to EMNLP
content='' additional_kwargs={'function_call': {'name': 'tavily_search', 'arguments': '{"query": "ActivityNet Challenge active speak
{'analyze_paper': {'messages': AIMessage(content='', additional_kwargs={'function_call': {'name': 'tavily_search', 'arguments': '{"c
{'tools': {'messages': [ToolMessage(content='{"query": "3D convolutional neural network active speaker detection", "follow_up_questi
content='{"query": "ActivityNet Challenge active speaker detection", "follow_up_questions": null, "answer": null, "images": [], "res
{'process_results': {'messages': [AIMessage(content='', additional_kwargs={'function_call': {'name': 'tavily_search', 'arguments':
content='methodology: 7\ntechnical_soundness: 6\nfactual_correctness: 7\nrigorosity: 6\nnovelty: 5\nresults: 7\nclarity: 8\nethics
{'finalscore': {'scores': {'methodology': 7.0, 'technical_soundness': 6.0, 'factual_correctness': 7.0, 'rigorosity': 6.0, 'novelty
Cosine Similarity: 0.25
Cosine Similarity: 0.27
Cosine Similarity: 0.17
Cosine Similarity: 0.17
Cosine Similarity: 0.64
P014.pdf belongs to CVPR
content='' additional_kwargs={'function_call': {'name': 'tavily_search', 'arguments': '{"search_depth": "advanced", "query": "residu
{'analyze_paper': {'messages': AIMessage(content='', additional_kwargs={'function_call': {'name': 'tavily_search', 'arguments': '{"c
{'tools': {'messages': [ToolMessage(content='{"query": "multi-frame perception and prediction for autonomous driving", "follow_up_qi
content='{"query": "residual learning and channel attention mechanisms for 3D object detection", "follow_up_questions": null, "answe
{'process_results': {'messages': [AIMessage(content='', additional_kwargs={'function_call': {'name': 'tavily_search', 'arguments':
content='methodology: 6\ntechnical_soundness: 6\nfactual_correctness: 7\nrigorosity: 5\nnovelty: 4\nresults: 5\nclarity: 7\nethics
{'finalscore': {'scores': {'methodology': 6.0, 'technical_soundness': 6.0, 'factual_correctness': 7.0, 'rigorosity': 5.0, 'novelty
Cosine Similarity: 0.75
Cosine Similarity: 0.39
Cosine Similarity: 0.30
Cosine Similarity: 0.38
Cosine Similarity: 0.27
P015.pdf belongs to CVPR
```

```
for i in range(16,18):
```

```
docs2=""
base_dir = "/content"
fname = f"P{i:03}.pdf"
os.path.join(base_dir, fname)
loader = PyPDFLoader(os.path.join(base_dir, fname))
docs = loader.load()
for doc in docs:
    docs2 = docs2 + doc.page_content
for step in graph.stream({
    "messages": [],
    "paper_content": docs2,
    "search_results": [],
    "scores": {},
    "red_result": ""
}):
    print(step)
div = step["finalscore"]["scores"]
data = np.array([div['methodology'],div['technical_soundness'],div['factual_correctness'],div['rigorosity'],div['novelty']
                ,div['results'],div['clarity'],div['ethics'], div['total']])
rty = rf_classifier.predict([data])
# Renamed from reasons
```



```

if(rty==0):

    conf="NA"

    print(f"{fname} belongs to {conf}")

else:

    dfg = graphs.invoke( {
        "messages": docs2,
        "arxiv_results": [ ],
        "imp_points" : " ",
        "retrieved_docs": [ ],
        "conference": " "
    } )

    conf=dfg["conference"]

    conference_reasons.append(get_reason_text(conf)) # Updated function call
    print(f"{fname} belongs to {conf}")

↩ content='' additional_kwargs={'function_call': {'name': 'tavily_search', 'arguments': '{"query": "Quantum entanglement communication
{"analyze_paper": {'messages': AIMessage(content='', additional_kwargs={'function_call': {'name': 'tavily_search', 'arguments': '{"
{'tools': {'messages': [ToolMessage(content='{"query": "Bayesian inference in cross-cultural ethics", "follow_up_questions": null,
content='{"query": "Quantum entanglement communication", "follow_up_questions": null, "answer": null, "images": [ ], "results": [{"ti
{'process_results': {'messages': [AIMessage(content='', additional_kwargs={'function_call': {'name': 'tavily_search', 'arguments':
content='methodology: 2\ntechnical_soundness: 1\nfactual_correctness: 3\nrigorosity: 1\nnovelty: 5\nresults: 1\nclarity: 7\nethics
{'finalscore': {'scores': {'methodology': 2.0, 'technical_soundness': 1.0, 'factual_correctness': 3.0, 'rigorosity': 1.0, 'novelty
P016.pdf belongs to NA
content='' additional_kwargs={'function_call': {'name': 'tavily_search', 'arguments': '{"search_depth": "advanced", "query": "buildi
{'analyze_paper': {'messages': AIMessage(content='', additional_kwargs={'function_call': {'name': 'tavily_search', 'arguments': '{"
{'tools': {'messages': [ToolMessage(content='{"query": "lag calibration of comments", "follow_up_questions": null, "answer": null,
content='{"query": "building an emotion lexicon for internet slang", "follow_up_questions": null, "answer": null, "images": [ ], "res
{'process_results': {'messages': [AIMessage(content='', additional_kwargs={'function_call': {'name': 'tavily_search', 'arguments':
content='methodology: 8\ntechnical_soundness: 7\nfactual_correctness: 7\nrigorosity: 7\nnovelty: 7\nresults: 7\nclarity: 8\nethics
{'finalscore': {'scores': {'methodology': 8.0, 'technical_soundness': 7.0, 'factual_correctness': 7.0, 'rigorosity': 7.0, 'novelty
Cosine Similarity: 0.32
Cosine Similarity: 0.91
Cosine Similarity: 0.29
Cosine Similarity: 0.31
Cosine Similarity: 0.27
P017.pdf belongs to CVPR
☐

for i in range(19,20):

    docs2=""
    base_dir = "/content"
    fname = f"P{i:03}.pdf"
    os.path.join(base_dir, fname)
    loader = PyPDFLoader(os.path.join(base_dir, fname))
    docs = loader.load()
    for doc in docs:
        docs2 = docs2 + doc.page_content
    for step in graph.stream({
        "messages": [ ],
        "paper_content": docs2,
        "search_results": [ ],
        "scores": { },
        "red_result": " "
    }) :
        print(step)
        div = step["finalscore"]["scores"]
        data = np.array([div['methodology'],div['technical_soundness'],div['factual_correctness'],div['rigorosity'],div['novelty'],
            ,div['results'],div['clarity'],div['ethics'], div['total']] )
        rty = rf_classifier.predict([data])
# Renamed from reasons
if(rty==0):

    conf="NA"

    print(f"{fname} belongs to {conf}")

else:

    dfg = graphs.invoke( {
        "messages": docs2,
        "arxiv_results": [ ],
        "imp_points" : " ",
        "retrieved_docs": [ ],
        "conference": " "
    } )

```

```

conf=dfg["conference"]

conference_reasons.append(get_reason_text(conf)) # Updated function call
print(f"{fname} belongs to {conf}")

content='' additional_kwargs={'function_call': {'name': 'tavily_search', 'arguments': '{"query": "WHO guidelines digital adherence t
{"analyze_paper": {'messages': AIMessage(content='', additional_kwargs={'function_call': {'name': 'tavily_search', 'arguments': '{"c
{'tools': {'messages': [ToolMessage(content='{"query": "digital adherence technologies tuberculosis treatment outcomes", "follow_up_
content='{"query": "WHO guidelines digital adherence technologies tuberculosis", "follow_up_questions": null, "answer": null, "image
{'process_results': {'messages': [AIMessage(content='', additional_kwargs={'function_call': {'name': 'tavily_search', 'arguments':
content='methodology: 8\ntechnical_soundness: 7\nfactual_correctness: 8\nrigorosity: 7\nnovelty: 7\nresults: 7\nclarity: 9\nethics
{'finalscore': {'scores': {'methodology': 8.0, 'technical_soundness': 7.0, 'factual_correctness': 8.0, 'rigorosity': 7.0, 'novelty
Cosine Similarity: 0.12
Cosine Similarity: 0.10
Cosine Similarity: 0.73
Cosine Similarity: 0.17
Cosine Similarity: 0.17
P019.pdf belongs to KDD

```

☐

```

for i in range(20,29):

    docs2=""
    base_dir = "/content"
    fname = f"P{i:03}.pdf"
    os.path.join(base_dir, fname)
    loader = PyPDFLoader(os.path.join(base_dir, fname))
    docs = loader.load()
    for doc in docs:
        docs2 = docs2 + doc.page_content
    for step in graph.stream({
        "messages": [],
        "paper_content": docs2,
        "search_results": [],
        "scores": {},
        "red_result": ""
    }) :
        print(step)
    div = step["finalscore"]["scores"]
    data = np.array([div['methodology'],div['technical_soundness'],div['factual_correctness'],div['rigorosity'],div['novelty'],
                    ,div['results'],div['clarity'],div['ethics'], div['total']] )
    rty = rf_classifier.predict([data])
    conference=[]
    name=[]
    conference_reasons=[] # Renamed from reasons
    if(rty==0):

        name.append(fname)
        conf="NA"
        conference.append(conf)
        print(f"{fname} belongs to {conf}")
    else:

        dfg = graphs.invoke( {
            "messages": docs2,
            "arxiv_results": [ ],
            "imp_points": "",
            "retrieved_docs": [ ],
            "conference": ""
        } )

        name.append(fname)
        conf=dfg["conference"]
        conference.append(conf)
        conference_reasons.append(get_reason_text(conf)) # Updated function call
        print(f"{fname} belongs to {conf}")

```

```

content='' additional_kwargs={'function_call': {'name': 'tavily_search', 'arguments': '{"query": "medieval gothic architecture restorati
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Cosine Similarity: 0.35
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Cosine Similarity: 0.29
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P023.pdf belongs to CVPR
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P024.pdf belongs to EMNLP
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Cosine Similarity: 0.26
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P027.pdf belongs to EMNLP
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```

```

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Cosine Similarity: 0.11
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Cosine Similarity: 0.04
Cosine Similarity: 0.08
P028.pdf belongs to EMNLP

```

```

-----
ValueError                                Traceback (most recent call last)
<ipython-input-54-83a6b677f601> in <cell line: 0>()
      5     fname = f"P{i:03}.pdf"
      6     os.path.join(base_dir, fname)
----> 7     loader = PyPDFLoader(os.path.join(base_dir, fname))
      8     docs = loader.load()
      9     for doc in docs:

```

```

----- 1 frames -----
/usr/local/lib/python3.11/dist-packages/langchain_community/document_loaders/pdf.py in __init__(self, file_path, headers)
    138         self.file_path = str(temp_pdf)
    139         elif not os.path.isfile(self.file_path):
--> 140             raise ValueError("File path %s is not a valid file or url" % self.file_path)
    141
    142     def __del__(self) -> None:

```

```

ValueError: File path /content/P029.pdf is not a valid file or url

```

```

for i in range(30,51):

```

```

docs2=""
base_dir = "/content"
fname = f"P{i:03}.pdf"
os.path.join(base_dir, fname)
loader = PyPDFLoader(os.path.join(base_dir, fname))
docs = loader.load()
for doc in docs:
    docs2 = docs2 + doc.page_content
for step in graph.stream({
    "messages": [],
    "paper_content": docs2,
    "search_results": [],
    "scores": {},
    "red_result": ""
}):
    print(step)
div = step["finalscore"]["scores"]
data = np.array([div['methodology'],div['technical_soundness'],div['factual_correctness'],div['rigorosity'],div['novelty'],
                  div['results'],div['clarity'],div['ethics'], div['total']] )
rty = rf_classifier.predict([data])
conference=[]
name=[]
conference_reasons=[] # Renamed from reasons
if(rty==0):

    conf="NA"

    print(f"{fname} belongs to {conf}")
else:

    dfg = graphs.invoke( {
        "messages": docs2,
        "arxiv_results": [ ],
        "imp_points": " ",
        "retrieved_docs": [],
        "conference": ""
    } )

    conf=dfg["conference"]

    conference_reasons.append(get_reason_text(conf)) # Updated function call
    print(f"{fname} belongs to {conf}")

```

```

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P030.pdf belongs to EMNLP

```

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P031.pdf belongs to EMNLP
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P033.pdf belongs to EMNLP
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Cosine Similarity: 0.12
Cosine Similarity: 0.13
Cosine Similarity: 0.13
P034.pdf belongs to CVPR
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for i in range(51,56):
    if(i==60 or i==78):
        continue
    docs2=""
    base_dir = "/content"
    fname = f"P{i:03}.pdf"
    os.path.join(base_dir, fname)
    loader = PyPDFLoader(os.path.join(base_dir, fname))
    docs = loader.load()
    for doc in docs:
        docs2 = docs2 + doc.page_content
    for step in graph.stream({
        "messages": [],
        "paper_content": docs2,
        "search_results": [],
        "scores": {},
        "red_result": ""
    }) :
        print(step)
    div = step["finalscore"]["scores"]
    data = np.array([div['methodology'],div['technical_soundness'],div['factual_correctness'],div['rigorosity'],div['novelty']
                    ,div['results'],div['clarity'],div['ethics'], div['total']])
    rty = rf_classifier.predict([data])
# Renamed from reasons
    if(rty==0):

        conf="NA"

        print(f"{fname} belongs to {conf}")
    else:

        dfg = graphs.invoke( {
            "messages": docs2,
            "arxiv_results": [ ],
            "imp_points": "",

```



```
"retrieved_docs": [],  
"conference": " "  
} )  
  
conf=dfg["conference"]  
  
conference_reasons.append(get_reason_text(conf)) # Updated function call  
print(f"{fname} belongs to {conf}")
```

```

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Skipping http://arxiv.org/pdf/2502.05395v2: 404 Client Error: Not Found for url: http://arxiv.org/pdf/2502.05395v2
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Cosine Similarity: 0.43
Cosine Similarity: 0.43
Cosine Similarity: 0.34
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{'tools': {'messages': [ToolMessage(content='{"query": "broader impact statements in research", "follow_up_questions": null, "answer"
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Cosine Similarity: 0.23
Cosine Similarity: 0.02
Cosine Similarity: 0.04
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{'finalscore': {'scores': {'methodology': 0.0, 'technical_soundness': 0.0, 'factual_correctness': 0.0, 'rigorosity': 0.0, 'novelty
-----
KeyError                                Traceback (most recent call last)
<ipython-input-59-2eff5dbfe9b6> in <cell line: 0>()
    20     div = step["finalscore"]["scores"]
    21     data =
np.array([div['methodology'],div['technical_soundness'],div['factual_correctness'],div['rigorosity'],div['novelty']
--> 22         ,div['results'],div['clarity'],div['ethics'], div['total']] )
    23     rty = rf_classifier.predict([data])
    24     conference=[]

KeyError: 'total'

```

```

for i in range(56,91):
    if(i==60 or i==78):
        continue
    docs2=""
    base_dir = "/content"
    fname = f"P{i:03}.pdf"
    os.path.join(base_dir, fname)
    loader = PyPDFLoader(os.path.join(base_dir, fname))

```

```

docs = loader.load()
for doc in docs:
    docs2 = docs2 + doc.page_content
for step in graph.stream({
    "messages": [],
    "paper_content": docs2,
    "search_results": [],
    "scores": {},
    "red_result": " "
}):
    print(step)
div = step["finalscore"]["scores"]
data = np.array([div['methodology'],div['technical_soundness'],div['factual_correctness'],div['rigorosity'],div['novelty'],
    ,div['results'],div['clarity'],div['ethics'], div['total']])
rty = rf_classifier.predict([data])

if(rty==0):

    conf="NA"

    print(f"{fname} belongs to {conf}")
else:

    dfg = graphs.invoke( {
        "messages": docs2,
        "arxiv_results": [ ],
        "imp_points": " ",
        "retrieved_docs": [],
        "conference": " "
    } )

    conf=dfg["conference"]

    conference_reasons.append(get_reason_text(conf)) # Updated function call
    print(f"{fname} belongs to {conf}")

content='' additional_kwargs={'function_call': {'name': 'tavily_search', 'arguments': '{"search_depth": "advanced", "query": "alte
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content=\'{"query": "alternative approaches to logic circuit design", "follow_up_questions": null, "answer": null, "images": [], "r
{\'process_results\': {\'messages\': [AIMessage(content=\'\', additional_kwargs={\'function_call\': {\'name\': \'tavily_search\', \'arguments\':
content=\'methodology: 0.0\ntechnical_soundness: 0.0\nfactual_correctness: 0.0\nrigorosity: 0.0\nnovelty: 0.0\nresults: 0.0\nclari
{\'finalscore\': {\'scores\': {\'methodology\': 0.0, \'technical_soundness\': 0.0, \'factual_correctness\': 0.0, \'rigorosity\': 0.0, \'novelt
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Cosine Similarity: 0.33
Cosine Similarity: 0.28
Cosine Similarity: 0.32
Cosine Similarity: 0.25
P057.pdf belongs to CVPR
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Cosine Similarity: 0.60
Cosine Similarity: 0.17
Cosine Similarity: 0.19
Cosine Similarity: 0.27
Cosine Similarity: 0.21
P058.pdf belongs to KDD
content='' additional_kwargs={'function_call': {'name': 'tavily_search', 'arguments': '{"query": "Backpropagation through time"}}
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{\'tools\': {\'messages\': [ToolMessage(content=\'{"query": "Recurrent Neural Networks Positional Encoding Large Vocabulary", "follow_u
content=\'{"query": "Backpropagation through time", "follow_up_questions": null, "answer": null, "images": [], "results": [{"title"
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{\'finalscore\': {\'scores\': {\'methodology\': 7.0, \'technical_soundness\': 6.0, \'factual_correctness\': 7.0, \'rigorosity\': 6.0, \'novelt
Cosine Similarity: 0.54
Cosine Similarity: 0.17
Cosine Similarity: 0.24
Cosine Similarity: 0.12
Cosine Similarity: 0.18
P059.pdf belongs to KDD
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```

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Cosine Similarity: 0.35
Cosine Similarity: 0.37
Cosine Similarity: 0.45

for i in range(92,136):

    docs2=""
    base_dir = "/content"
    fname = f"P{i:03}.pdf"
    os.path.join(base_dir, fname)
    loader = PyPDFLoader(os.path.join(base_dir, fname))
    docs = loader.load()
    for doc in docs:
        docs2 = docs2 + doc.page_content
    for step in graph.stream({
        "messages": [],
        "paper_content": docs2,
        "search_results": [],
        "scores": {},
        "red_result": " "
    }) :
        print(step)
        div = step["finalscore"]["scores"]
        data = np.array([div['methodology'],div['technical_soundness'],div['factual_correctness'],div['rigorousity'],div['novelty'],
                        ,div['results'],div['clarity'],div['ethics'], div['total']] )
        rty = rf_classifier.predict([data])

        if(rty==0):

            conf="NA"

            print(f"{fname} belongs to {conf}")
        else:

            dfg = graphs.invoke( {
                "messages": docs2,
                "arxiv_results": [ ],
                "imp_points" : " ",
                "retrieved_docs": [],
                "conference": " "
            } )

            conf=dfg["conference"]

            conference_reasons.append(get_reason_text(conf)) # Updated function call
            print(f"{fname} belongs to {conf}")

        content='' additional_kwargs={'function_call': {'name': 'tavily_search', 'arguments': '{"query": "Alternatives to \\\"sub-pixel con
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P092.pdf belongs to CVPR
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```