

UI Technology Stack Recommendations

Recommended Stack

Primary Framework: FastAPI

1. Advantages:

- Modern, fast Python web framework
- Built-in API documentation (Swagger/OpenAPI)
- Async support for better performance
- Easy integration with ML/AI components
- Strong type hints and validation

Frontend Options:

1. React + TypeScript (Recommended)

- Advantages:
 - Component-based architecture
 - Strong typing with TypeScript
 - Large ecosystem of libraries
 - Good for complex document interactions
 - Easy integration with FastAPI backend
- Key Libraries:
 - react-dropzone (file uploads)
 - react-query (data fetching)
 - tailwindcss (styling)
 - react-pdf (document preview)

2. Streamlit (Alternative for Quick Development)

- Advantages:
 - Python-native
 - Rapid prototyping
 - Built-in ML/AI visualization
 - Minimal frontend expertise required
- Best for:
 - Initial prototyping
 - Data science focused interfaces
 - Quick iteration cycles

Supporting Technologies:

1. Authentication:

- Python-JOSE for JWT
- Passlib for password hashing

2. File Handling:

- python-multipart
- aiofiles for async file operations

3. Database Access:

- SQLAlchemy for ORM
- Alembic for migrations
- asyncpg for async database operations

4. Document Processing:

- PyPDF2 for PDF handling
- python-docx for Word documents
- Tesseract for OCR capabilities

Deployment Considerations:

- Docker containers for consistency
- Nginx as reverse proxy
- Redis for caching
- MinIO for document storage