🚀 GitHub Setup Guide - Fraud Detection Portfolio

Complete step-by-step guide to publish your fraud detection case study on GitHub.

📋 Pre-Requirements

- ☐ GitHub account created
- ☐ Git installed on your computer
- ☐ Python 3.11+ installed
- ☐ All artifacts from Claude conversation saved

🗂️ Step 1: Create Repository Structure Locally

1.1 Create Main Folder

```bash
# Open terminal/command prompt
mkdir fraud-detection-system
cd fraud-detection-system
```

1.2 Create Folder Structure

```bash
# Create all necessary folders
mkdir -p src/data src/models src/explain src/inference
mkdir -p notebooks config tests docker model_artifacts
mkdir -p .github/workflows

# Verify structure
tree -L 2
```

Expected output:

```
fraud-detection-system/
├── src/
│   ├── data/
│   ├── models/
│   ├── explain/
│   └── inference/
├── notebooks/
├── config/
├── tests/
├── docker/
├── model_artifacts/
└── .github/
    └── workflows/
```

📝 Step 2: Create Essential Files

2.1 Copy README.md

1. Open the **"Fraud Detection System - Portfolio"** artifact from Claude
2. Copy entire content
3. Save as `README.md` in root folder

```bash
# Verify file was created
ls -lh README.md
```

2.2 Copy requirements.txt

1. Open the **"requirements.txt"** artifact
2. Save in root folder as `requirements.txt`

2.3 Copy LICENSE

1. Open the **"LICENSE (MIT)"** artifact
2. Save as `LICENSE` (no extension) in root folder

2.4 Copy .gitignore

1. Open the **".gitignore"** artifact
2. Save as `.gitignore` in root folder

Important: On Windows, save as `.gitignore` (with dot at start)

2.5 Copy Example Code

1. Open **"src/inference/predict.py"** artifact
2. Create file: `src/inference/predict.py`
3. Paste content

🔧 Step 3: Initialize Git Repository

3.1 Initialize Git

```bash
# Make sure you're in fraud-detection-system folder
git init

# Verify .git folder was created
ls -la | grep .git
```

3.2 Add Files to Git

```bash
# Add all files
git add .

# Verify what will be committed
git status
```

Expected output:

```
On branch main
Changes to be committed:
  new file:   .gitignore
  new file:   LICENSE
  new file:   README.md
  new file:   requirements.txt
  new file:   src/inference/predict.py
  ...
```

3.3 First Commit

```bash
```

```
# Create first commit
git commit -m "Initial commit: Fraud detection system portfolio"

# Verify commit was created
git log --oneline
```

🌐 Step 4: Create GitHub Repository

4.1 Go to GitHub

1. Open browser: https://github.com
2. Click **"New"** (green button) or **"+"** → **"New repository"**

4.2 Repository Settings

Fill out:

- **Repository name:** `fraud-detection-system`
- **Description:** `ML-powered fraud detection with 91% AUC | XGBoost, SHAP, Cost-Sensitive Learning`
- **Visibility:** ✅ Public (for portfolio)
- **Initialize repository:** ❌ **DO NOT CHECK** (you already have files)
- Click **"Create repository"**

4.3 Copy Repository URL

GitHub will show commands. Copy the **HTTPS URL**:

```
https://github.com/YOUR_USERNAME/fraud-detection-system.git
```

📤 Step 5: Push to GitHub

5.1 Add Remote Origin

```
bash

# Replace YOUR_USERNAME with your GitHub username
git remote add origin https://github.com/YOUR_USERNAME/fraud-detection-system.git

# Verify remote was added
git remote -v
```

5.2 Push Code

```bash
# Push to main branch
git branch -M main
git push -u origin main
```

If authentication required:

- GitHub will ask for username and password
- **Password:** Use **Personal Access Token** (not your GitHub password)
  - Generate token: Settings → Developer settings → Personal access tokens → Tokens (classic)
  - Scopes needed: `repo` (full control)

5.3 Verify Upload

1. Refresh GitHub repository page
2. You should see all files uploaded
3. README.md will be displayed automatically

🎨 Step 6: Add Visual Enhancements

6.1 Add Repository Topics

On GitHub repository page:

1. Click "⚙️ **Settings**" tab
2. Scroll to **"Topics"**
3. Add: `machine-learning`, `fraud-detection`, `xgboost`, `shap`, `python`, `fintech`, `data-science`
4. Click **"Save changes"**

6.2 Add About Section

On main repository page:

1. Click "⚙️" next to "About"
2. **Description:** `Real-time fraud detection system with 73% recall and 94% precision. Built with XGBoost, SHAP explainability, and cost-sensitive learning.`
3. **Website:** (your portfolio URL if you have one)
4. **Topics:** (should auto-populate from step 6.1)

5. Click **"Save changes"**

6.3 Add Repository Image (Optional)

1. Create a simple banner image (1280x640px)
2. GitHub Settings → General → Social preview → Upload image

Suggestion: Use Canva to create banner with:

- Title: "Fraud Detection System"
- Subtitle: "91% AUC | $1.2M Annual Savings"
- Technologies: Python, XGBoost, SHAP logos

📊 Step 7: Add Visualizations (Optional but Recommended)

7.1 Create `images/` Folder

```bash
mkdir images
```

7.2 Add Your Graphs

Copy these images from your case:

- `images/roc_curves.png`
- `images/confusion_matrix.png`
- `images/cost_sensitivity.png`
- `images/shap_importance.png`

7.3 Update README to Show Images

Edit `README.md`, add after "Performance Benchmarks":

```markdown
```

```
### Visualization Examples

**ROC Curves Comparison:**
![ROC Curves](images/roc_curves.png)

**Cost Sensitivity Analysis:**
![Cost Analysis](images/cost_sensitivity.png)

**SHAP Feature Importance:**
![SHAP Importance](images/shap_importance.png)
```

7.4 Commit and Push Images

```bash
git add images/
git commit -m "Add visualization examples"
git push origin main
```

⚙️ Step 8: Add GitHub Actions (Optional - Automated Testing)

Create `.github/workflows/tests.yml`:

```yaml
```

```yaml
name: Tests

on: [push, pull_request]

jobs:
  test:
    runs-on: ubuntu-latest

    steps:
    - uses: actions/checkout@v3

    - name: Set up Python
      uses: actions/setup-python@v4
      with:
        python-version: '3.11'

    - name: Install dependencies
      run: |
        pip install -r requirements.txt
        pip install pytest pytest-cov

    - name: Run tests
      run: pytest tests/ -v --cov=src
```

Commit:

```bash
git add .github/workflows/tests.yml
git commit -m "Add GitHub Actions for automated testing"
git push origin main
```

This adds a **"Tests Passing"** badge to your repo (professional look).

🏆 Step 9: Final Touches

9.1 Add Badges to README

Add at top of `README.md` (after title):

```markdown
```

```
[![Tests](https://github.com/YOUR_USERNAME/fraud-detection-system/workflows/Tests/badge.svg)](https://github.com/Y
[![Python](https://img.shields.io/badge/Python-3.11-blue.svg)](https://www.python.org/)
[![License](https://img.shields.io/badge/License-MIT-green.svg)](LICENSE)
[![PRs Welcome](https://img.shields.io/badge/PRs-welcome-brightgreen.svg)](https://github.com/YOUR_USERNAME/fraud
```

9.2 Add "Star this repo" Call-to-Action

Add in README after Executive Summary:

```
markdown

---

⭐ **Found this project helpful?** Give it a star to show your support!

📧 **Questions?** Feel free to open an issue or contact me on [LinkedIn](https://linkedin.com/in/jorgefumagalli)

---
```

9.3 Pin Repository on Your Profile

1. Go to your GitHub profile: `https://github.com/YOUR_USERNAME`
2. Click **"Customize your pins"**
3. Select `fraud-detection-system`
4. Click **"Save pins"**

Now this project appears prominently on your profile! 🎉

🔗 Step 10: Share on LinkedIn

10.1 Create LinkedIn Post

Template:

🚀 Excited to share my latest ML project: Real-Time Fraud Detection System!

🎯 Built a production-ready fraud detection framework that achieved:
• 91% AUC (MLP Neural Network)
• 73% fraud capture rate (XGBoost)
• 94% precision (Random Forest)
• <100ms inference time

💡 Key Innovation: Cost-adaptive model switching based on real-time risk assessment

🔧 Tech Stack: Python, XGBoost, SHAP, scikit-learn

📊 Business Impact: $1.2M projected annual savings through 72% fraud loss reduction

Check out the full project on GitHub:
👉 [https://github.com/YOUR_USERNAME/fraud-detection-system]

Open to collaborations and feedback! 💬

#MachineLearning #FraudDetection #DataScience #FinTech #Python #XGBoost #AI

10.2 Add to Portfolio Website

If you have a portfolio, add project card:

- **Title:** Fraud Detection System
- **Description:** ML-powered real-time fraud detection with 91% AUC
- **Technologies:** Python, XGBoost, SHAP, scikit-learn
- **Link:** GitHub repository URL
- **Image:** ROC curve or cost sensitivity graph

✅ Final Checklist

Before considering the project "published":

- [ ] All files pushed to GitHub
- [ ] README.md displays correctly on repository page
- [ ] Repository has description and topics
- [ ] LICENSE file present
- [ ] .gitignore configured (no sensitive data committed)
- [ ] requirements.txt complete
- [ ] At least 1 example code file (predict.py)

- [ ] Images/visualizations included (optional but recommended)
- [ ] Repository pinned on your GitHub profile
- [ ] LinkedIn post published (optional)
- [ ] Added to portfolio website (optional)

🆘 Troubleshooting

Problem: "Permission denied (publickey)"

Solution: Use HTTPS instead of SSH:

```bash
git remote set-url origin https://github.com/YOUR_USERNAME/fraud-detection-system.git
```

Problem: "Repository not found"

Solution: Verify URL is correct:

```bash
git remote -v
# Should show: https://github.com/YOUR_USERNAME/fraud-detection-system.git
```

Problem: "Failed to push - authentication required"

Solution: Create Personal Access Token:

1. GitHub → Settings → Developer settings → Personal access tokens → Generate new token
2. Select scope: `repo` (full control)
3. Copy token and use as password when pushing

Problem: Files too large (>100MB)

Solution: Add to .gitignore:

```bash
```

```
# Add line to .gitignore
echo "large_file.csv" >> .gitignore

# Remove from git tracking
git rm --cached large_file.csv

# Commit
git commit -m "Remove large file from tracking"
```

🎓 Pro Tips

1. **Regular Updates:** Add new features and commit with clear messages
2. **Documentation:** Keep README updated as project evolves
3. **Issues Tab:** Enable and use for tracking improvements
4. **Releases:** Create releases for major milestones (v1.0.0, v2.0.0)
5. **Contributors:** Welcome contributions through clear CONTRIBUTING.md
6. **Star Count:** Matters for visibility - share on social media

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📞 Need Help?

If you encounter any issues:

1. Check GitHub's official documentation: https://docs.github.com
2. Search Stack Overflow: https://stackoverflow.com/questions/tagged/git
3. Come back here and ask Claude! 😊

Congratulations! Your fraud detection project is now live on GitHub! 🎉

Next step: Keep building amazing projects and grow your portfolio! 💪