Week 1 Activity Log

# Week 1: Individual Activity Log

## Daily Activities and Progress

### Day 1: Project Discovery and Repository Analysis

\*\*Time Spent\*\*: 3 hours

\*\*Activities Completed\*\*:

* Found and cloned the COVID-19 chest X-ray Vision Transformer repository
* Analyzed repository structure and identified key components
* Reviewed all Python files in Internet\_Source\_Code directory
* Examined data processing and splitting methodology

\*\*Key Findings\*\*:

* Repository contains complete ViT implementation for medical imaging
* Pre-processed dataset splits following medical best practices
* Professional code structure with proper documentation
* Results and visualizations already generated

\*\*Challenges Encountered\*\*:

* Initial confusion about repository structure
* Understanding medical data splitting requirements
* Learning Vision Transformer architecture concepts

### Day 2: Technical Analysis and Planning

\*\*Time Spent\*\*: 2.5 hours

\*\*Activities Completed\*\*:

* Deep dive into Vision Transformer code implementation
* Analysis of COVID19Dataset class and data loading
* Review of training pipeline and evaluation metrics
* Examined processed data files and split information

\*\*Technical Understanding Gained\*\*:

* Vision Transformer adaptation for medical images
* Patient-level data splitting to prevent leakage
* Binary classification approach: COVID-19 vs Pneumonia
* Attention mechanism application to chest X-rays

\*\*Documentation Created\*\*:

* Code analysis notes and architecture understanding
* Data processing methodology documentation
* Implementation requirements and dependencies list

### Day 3: Research and Literature Review

\*\*Time Spent\*\*: 2 hours

\*\*Activities Completed\*\*:

* Research on Vision Transformers in medical imaging
* Study of COVID-19 detection using deep learning
* Review of medical AI ethics and best practices
* Analysis of related work and baseline comparisons

\*\*Knowledge Acquired\*\*:

* Medical imaging challenges vs natural image processing
* Importance of patient privacy in medical data
* Vision Transformer advantages over CNNs for some tasks
* Current state of AI in COVID-19 diagnosis

### Day 4: Planning and Documentation

\*\*Time Spent\*\*: 2 hours

\*\*Activities Completed\*\*:

* Created comprehensive project plan and timeline
* Documented all findings and analysis results
* Prepared environment setup requirements
* Planned next steps for implementation phase

\*\*Deliverables Completed\*\*:

* Week 1 documentation files
* Technical analysis and code review
* Project planning and timeline
* Research questions and objectives

## Learning Outcomes

### Technical Skills Developed:

* Understanding Vision Transformer architecture
* Medical data handling and ethics knowledge
* PyTorch and deep learning implementation skills
* Code analysis and documentation abilities

### Domain Knowledge Gained:

* Medical AI applications and challenges
* COVID-19 detection using chest X-rays
* Computer vision in healthcare settings
* Research methodology and analysis

## Time Management Analysis

\*\*Total Time Invested\*\*: 9.5 hours

* Code analysis and review: 40%
* Research and literature review: 25%
* Documentation and planning: 20%
* Technical learning: 15%

## Challenges and Solutions

\*\*Challenge 1\*\*: Understanding medical data requirements \*\*Solution\*\*: Researched patient privacy and data splitting best practices

\*\*Challenge 2\*\*: Vision Transformer complexity \*\*Solution\*\*: Studied architecture papers and implementation details

\*\*Challenge 3\*\*: Repository code analysis \*\*Solution\*\*: Systematic review of each file with detailed documentation

## Next Week Planning

### Immediate Priorities:

1. Set up development environment
2. Install and configure all dependencies
3. Test repository code execution
4. Begin model training experiments

### Learning Goals:

1. Hands-on experience with Vision Transformers
2. Medical image preprocessing and augmentation
3. Model evaluation and performance analysis
4. Results interpretation and visualization

This week provided excellent foundation for understanding both the technical and practical aspects of applying Vision Transformers to medical imaging.