Objective: Build a foundational understanding of FL concepts, privacy, and real-world applications.

Day 1: Introduction to Federated Learning

- 📄 **Read:** Google AI Blog: Federated Learning Overview
- 🎥 **Watch:** Federated Learning Overview by AI Coffee Break
- 📘 **Article:** An Introduction to Federated Learning

Day 2: Federated Learning vs. Centralized Learning

- 📄 **Read:** Federated Learning: The Good, the Bad, and the Ugly
- 🎥 **Watch:** Decentralized AI Overview by Two Minute Papers
- 📘 **Article:** Why FL is Better than Centralized ML

Day 3: Key Challenges in FL

- 📄 **Read:** Challenges and Opportunities in FL
- 🎥 **Watch:** Challenges in Federated Learning
- 📘 **Deep Dive:** OpenMined: Current Challenges in FL

Day 4: Privacy in Federated Learning

- 📄 **Read:** DeepMind's Differential Privacy Overview
- 🎥 **Watch:** Differential Privacy Simplified
- 📘 **Whitepaper:** Apple's Differential Privacy Approach in FL

Day 5: Federated Averaging Algorithm

- 📄 **Read:** FedAvg Paper: Communication-Efficient Learning
- 🎥 **Watch:** FedAvg Algorithm Explained
- 📘 **Resource:** FedAvg in TensorFlow

Day 6: Real-World Applications of FL

- 📄 **Read:** FL in Healthcare
- 🎥 **Watch:** Federated Learning in Action
- 📘 **Resource:** Case Study on Google Keyboard

Day 7: Recap & Reflection

- Write a summary of what you learned.
- Share your reflections on LinkedIn or Twitter to spark discussions.

Week 2: Tools and Frameworks for Federated Learning

Objective: Explore tools, frameworks, and practical implementations.

Day 8: TensorFlow Federated (TFF) Basics

- 📄 **Read:** TFF Overview
- 🎥 **Watch:** Getting Started with TFF
- 📘 **Resource:** TFF Quickstart Guide

Day 9: Flower Framework for FL

- 📄 **Read:** Flower Framework Documentation
- 🎥 **Watch:** Flower Framework Introduction
- 📘 **Resource:** Quickstart with Flower

Day 10: PySyft and Secure FL

- 📄 **Read:** OpenMined's PySyft Overview
- 🎥 **Watch:** PySyft Tutorial
- 📘 **Task:** Install PySyft and explore simple demos.

Day 11: Secure Aggregation Techniques

- 📄 **Read:** Secure Aggregation in FL
- 🎥 **Watch:** Secure Aggregation Explained

Day 12: Handling Non-IID Data

- 📄 **Read:** Handling Heterogeneous Data in FL
- 📘 **Resource:** Google Research Blog on Non-IID Challenges

Day 13: Comparing Tools for FL

- 📄 **Read:** Comparison of FL Frameworks
- 🎥 **Watch:** Tools for Federated Learning

Day 14: Practice Day

- **Task:** Choose any tool (TFF, Flower, PySyft) and implement a small demo.

Week 3: Advanced Topics

Objective: Dive into cutting-edge research and techniques.

Day 15: FL for IoT Devices

- 📄 **Read:** Federated Learning in IoT
- 🎥 **Watch:** IoT Meets Federated Learning

Day 16: Personalization in FL

- 📄 **Read:** Personalized Federated Learning
- 🎥 **Watch:** FL Personalization Explained

Day 17: Federated GANs

- 📄 **Read:** Federated GANs Overview
- 🎥 **Watch:** GANs in Federated Learning

Day 18: Optimization Techniques

- 📄 **Read:** Optimizing FL Systems
- 📘 **Resource:** Efficient Aggregation in FL

Day 19: FL in Healthcare

- 📄 **Read:** FL for Medical Imaging
- 🎥 **Watch:** FL in Radiology

Day 20: Recap Advanced Topics

- Write a blog post or create a presentation summarizing the week.

Week 4: Capstone Project

Objective: Implement a Federated Learning solution.

Day 21-23: Project Design

- Define goals, datasets, and tools.

Day 24-27: Implementation

- Implement your project using a framework of your choice.

Day 28: Analyze Results

- Visualize and interpret key metrics.

Day 29: Documentation

- Write a blog post or create a GitHub README.

Day 30: Presentation

- Share your project with your network.

Let me know if you want specific tools or links! 🚀

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ChatGPT peut faire des erreur

Week 1: Foundations of Federated Learning

Goal: Understand the basics and why Federated Learning (FL) is essential.

Day 1: Introduction to Federated Learning

- 📄 **Read:** Google AI's Federated Learning Overview
- 🎥 **Watch:** Federated Learning Explained - AI Coffee Break
- 🛠️ **Exercise:** Write a one-paragraph explanation of FL in your own words.

Day 2: Key Concepts and Challenges

- 📄 **Read:** Challenges in Federated Learning
- 🎥 **Watch:** AI for Edge Devices
- 🛠️ **Exercise:** Create a flowchart for a basic FL process.

Day 3: Privacy in FL

- 📄 **Read:** Federated Learning and Differential Privacy
- 🎥 **Watch:** Differential Privacy Basics

Day 4: Comparing FL with Centralized Learning

- 📄 **Read:** How FL Addresses Centralized Data Challenges
- 🎥 **Watch:** Decentralized AI and Its Importance

Day 5: Federated Averaging Algorithm

- 📄 **Read:** FedAvg Paper
- 🎥 **Watch:** Understanding FedAvg

Day 6: Real-World FL Use Cases

- 📄 **Read:** FL in Healthcare
- 🎥 **Watch:** Federated Learning Applications

Day 7: Recap and Review

- 🛠️ **Exercise:** Write a blog or LinkedIn post summarizing your week's learnings.

Week 2: Tools and Frameworks

Goal: Gain hands-on experience with FL tools.

Day 8: TensorFlow Federated (TFF)

- 📄 **Read:** TensorFlow Federated Overview
- 🎥 **Watch:** Introduction to TFF
- 🛠️ **Exercise:** Use TFF to simulate a basic FL setup with MNIST data.

Day 9: PySyft for Privacy

- 📄 **Read:** PySyft Documentation
- 🎥 **Watch:** Intro to PySyft
- 🛠️ **Exercise:** Install PySyft and simulate a secure FL environment.

Day 10: Flower Framework Basics

- 📄 **Read:** Flower Framework
- 🎥 **Watch:** Getting Started with Flower
- 🛠️ **Exercise:** Build a small FL project with Flower.

Day 11: Secure Aggregation

- 📄 **Read:** Secure Aggregation in FL
- 🎥 **Watch:** Explainer Video on Secure Aggregation

Day 12: Handling Data Heterogeneity

- 📄 **Read:** Federated Learning with Heterogeneous Data
- 🛠️ **Exercise:** Experiment with varying datasets in Flower.

Day 13: Comparing Tools

- 📄 Compare TensorFlow Federated, PySyft, and Flower for scalability and privacy.
- 🎥 **Watch:** Federated Learning in Practice

Day 14: Review and Hands-On Project

- 🛠️ Create a project combining TFF and Flower to train a basic FL model.

Week 3: Advanced Concepts

Goal: Explore advanced techniques and applications.

Day 15: FL and Differential Privacy

- 📄 **Read:** Differential Privacy Meets Federated Learning
- 🎥 **Watch:** DeepMind on Privacy in FL

Day 16: Personalization in FL

- 📄 **Read:** Personalized FL Paper
- 🎥 **Watch:** Explainer on Personalized FL

Day 17: Federated GANs

- 📄 **Read:** Federated Learning with GANs
- 🎥 **Watch:** GANs in FL

Day 18: FL in IoT Applications

- 📄 **Read:** IoT and Federated Learning
- 🎥 **Watch:** FL for IoT Use Cases

Day 19: FL in Edge AI

- 📄 **Read:** FL for Edge Computing
- 🎥 **Watch:** Edge AI in Practice

Day 20: Recap and Review

- 🛠️ Summarize key concepts learned and prepare for a capstone project.

Week 4: Capstone Project

Goal: Implement and document a full FL project.

Day 21-23: Plan and Outline

- Choose a domain (e.g., healthcare, finance, IoT).
- Draft project goals, datasets, and tools to be used.

Day 24-27: Implement the Project

- Use Flower or TensorFlow Federated for implementation.

Day 28: Analyze Results

- Use visualizations and metrics to showcase outcomes.

Day 29: Document Your Work

- Write a blog post or GitHub README to share your project.

Day 30: Share and Present

- Present your work on LinkedIn or in a community forum.

Let me know which step you want detailed guidance on! 🚀

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