Roadmap to Become an AI Engineer (Tailored for Akshay Surase)

📌Background

You already have strong **full-stack development experience** and exposure to **healthcare AI applications** (speech-to-text models). With only weekends free, this roadmap is designed to make you AI Engineer–ready within **12–15 months**, balancing depth and practicality.

🕐Phase 1: Core Foundations (Months 1–3)

Focus: Build strong mathematical and ML basics.

Skills:

- **Mathematics**: Linear algebra, Probability, Statistics, Calculus.
- **Machine Learning**: Regression, Classification, Clustering, Evaluation metrics.
- **Libraries**: NumPy, Pandas, Matplotlib, Scikit-Learn.

Weekend Plan:

- **Saturday**: 2 hrs Math + 2 hrs ML concepts.
- **Sunday**: 3 hrs coding ML problems + 1 hr Kaggle datasets.

Resources:

- Andrew Ng's Machine Learning Specialization (Coursera).
- "Hands-On Machine Learning with Scikit-Learn, Keras, and TensorFlow" (Book).

🕐Phase 2: Deep Learning (Months 4–7)

Focus: Understand and implement neural networks.

Skills:

- Basics: Neural Networks, Backpropagation, Activation functions.
- **Architectures**: CNNs, RNNs, LSTMs, Transformers.
- **Frameworks**: PyTorch (preferred), TensorFlow.

Weekend Plan:

- **Saturday**: 3 hrs theory + 1 hr coding.

• **Sunday**: 4 hrs project building.

Projects:

- Image classification (CIFAR-10).
- Sentiment analysis (IMDb).
- Mini speech-to-text model.

Resources:

- DeepLearning.AI Deep Learning Specialization.
- PyTorch tutorials.

🕐 Phase 3: Specialization (Months 8–12)

Focus: NLP & Speech AI (aligned with your healthcare work).

Skills:

- NLP: Transformers, BERT, GPT, Hugging Face.
- Speech AI: Whisper, wav2vec 2.0.
- Secondary: Computer Vision basics (YOLO, OpenCV).

Projects:

- Medical transcription AI.
- Healthcare chatbot.
- Audio summarization tool.

Resources:

- Hugging Face free course.
- "Natural Language Processing with Transformers" (Book).

🕐 Phase 4: AI Engineering & Deployment (Months 13–15)

Focus: Take models into production.

Skills:

- MLOps: Docker, Kubernetes, CI/CD, Monitoring.
- Cloud ML: AWS SageMaker / GCP Vertex AI.
- APIs: FastAPI for model serving.

Resources:

- Made With ML (MLOps guide).
- Full Stack Deep Learning course.

Project:

- Deploy healthcare AI model using FastAPI + Docker + AWS.

🕐 Phase 5: Advanced & Continuous Learning (Months 16+)

- Reinforcement Learning.
- Generative AI (Diffusion models, LLM fine-tuning).
- Edge AI (TinyML).
- Explainable & Responsible AI.

📅 Timeline (With Weekend Learning)

- **Months 1–3**: ML + Math foundations.
- **Months 4–7**: Deep Learning.
- **Months 8–12**: NLP + Speech AI specialization.
- **Months 13–15**: MLOps & Deployment.
- **Months 16+**: Advanced Topics.

💼 Career Opportunities

With this roadmap, you can target: - AI Engineer. - Machine Learning Engineer. - NLP/Speech AI Engineer. - Applied Scientist (Healthcare AI). - MLOps Engineer. - AI Product Developer.

Long-term: **AI Architect / AI Lead**.

🔑 Extra Skills to Add

- PyTorch (mandatory).
- Hugging Face Transformers.
- MLOps (Docker, CI/CD, Cloud).
- Mathematical depth in ML.

🔗 Key Takeaway

By following this **12–15 month roadmap** with consistent weekend learning, you'll transition from a **Full Stack Developer with AI exposure** to a **job-ready AI Engineer** with specialization in **Healthcare AI (NLP + Speech)**.