Charcha

- Initialization

  - Finalize a project
    - Look for trends in AI
    - Form a subset of interesting topics
    - Talk to the community to identify potential caveats in the selected topics
    - Understand the product demand
    - Identify target population
    - Define scope of the project
    - Form a concise description of the idea and possible approaches to solve the problem
  - Venture for Sponsors
    - Search for potential sponsors in our LinkedIn network
    - Shortlist some professionals
    - Initiate communication via inmails and calls (if possible)
    - Book time slots for project debriefing
    - Gather feedback
    - Lock the sponsor
- Business Understanding

  - Determine Business Objectives
    - Background
      - Define motivation
      - Our interest in the project
    - Business Objectives
      - Identify what the product will do
      - Determine the usage and end goal
    - Business Success Criteria

        - If correct amount of data is collected
        - if required variation is fed the the algorithm
        - if the model is able to predict correctly 80% of the time
- Assess the Situation
    - Inventory of Resources
        - Check for available computational resources
        - Asses health on GPUs on system
        - Check for compatibility with latest CUDA libraries
    - Requirements
        - Check for base configuration needed
        - Understanding the sign language
        - Knowledge of fingerspelling using ASL
        - Ask what is desired form of product: desktop app or web app
    - Assumptions
        - The app won't be used in crowded environment
    - Constraints
        - Computational resources
        - Dataset size
        - Lack of model training time
    - Terminology
        - Browsing and Brainstorming for product names
        - Finalizing the selection
        - Conveying with the sponsors
    - Costs and Benefits
        - Rendered as free service to the NGO
- Determine Goal
    - Prediction Goal
        - 89% accuracy in real world setting
        - Near real time predictions
    - UI/UX Goal
        - Build a functional MVP adhering to sponsor guidelines
- Produce Project Plan
    - Project Plan

- Initial Assessment of Tools and Techniques

- Data Understanding

  - Collect Initial Data
    - Gather train, test and validation images for 36 class
    - Collect 3000 images per class from varied sources
  - Explore Data
  - Verify Data Quality
    - Run through sponsors
    - Get green flag to proceed

- Data Preparation

  - Select Data
    - Collect all good images from the dataset
    - Also check for any imbalance created while sampling
  - Clean Data
    - Add Gaussian Blur on top of all images
    - Data Labelling
    - Define ROI (Region of Interest)
  - Format Data
    - Arrange images in folders
    - Write code to automate the procedure
    - Write code for dividing images in train, test and validation splits

- Modeling

  - Select Modeling Techniques
    - Try transfer learning with VGG-19,16, Resent and ImageNet
      - Freeze all layers

        - Freeze different amount of layers
        - Train for varied number of epochs
    - Make models in conjunction with state of the art models
  - Build Model
    - Try different loss functions, optimizers and activation functions
    - Model purning
    - Enable gpus for training
  - Assess Model
    - Hyperparameter tuning
- Evaluation

  - Evaluate Results
  - Review Process
  - Determine Next Steps
- Deployment

  - Plan Deployment
    - Explore different technologies to build desktop app
    - Write code to render UI/UX interface
  - Produce Final Report
  - Review Project