

Ideation Phase


Brainstorm & Idea Prioritization Template

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| Assignment Date | 19 September 2022 |
| Team ID | PNT2022TMID27796 |
| Project Name | A Novel Method for Handwritten Digit Recognition System |
| Maximum Marks | 2 Marks |

Brainstorm & Idea Prioritization Template:




Step-1 Team gathering collaboration and select the problem statement


Template



Brainstorm & idea prioritization


Use this template in your own brainstorming sessions so your team can unleash their imagination and start shaping concepts even if you're not sitting in the same room.

 10 minutes to prepare
 1 hour to collaborate
 2-8 people recommended



Before you collaborate

A little bit of preparation goes a long way with this session. Here's what you need to do to get going.

 10 minutes

A Team gathering

Define who should participate in the session and send an invite. Share relevant information or pre-work ahead.

B Set the goal

Think about the problem you'll be focusing on solving in the brainstorming session.

C Learn how to use the facilitation tools


Use the Facilitation Superpowers to run a happy and productive session.

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1


A Novel Method for Handwritten Digit Recognition System

*Handwritten digit recognition using MNIST dataset and CNN
*Detects the scanned images of handwritten digits

 5 minutes


PROBLEM


How might we detect the scanned images of handwritten digits?





Key rules of brainstorming


To run an smooth and productive session


 Stay in topic.

 Encourage wild ideas.

 Defer judgment.

 Listen to others.

 Go for volume.

 If possible, be visual.

Step-2: Brainstorm, Idea Listing and Grouping

Brainstorm and Idea Listing

2

Brainstorm

Write down any ideas that come to mind that address your problem statement.

🕒 10 minutes

ADITYA R

MNIST database of handwritten digits has a training set of 60000 examples and test set of 10000 examples. It is a subset of larger set available from NIST. The digits have been size-normalized and centered in a fixed-size image.

Convolution layer with ReLU activation function and a max-pool layer. ReLU introduces non-linearity and Max-pooling helps with removing noise.

The algorithm used by convolutional neural networks is better suited for visual image processing than the one used in traditional artificial neural networks: convolutional layers and pooling layers.

When you check the shape of the dataset to see if it is compatible to use in for CNN

HARISH KUMAR B

Convolutional layers take advantage of the fact that all image can be encoded in terms of 1s and 0s to create feature maps. A feature detector is simply a matrix, whose values correspond to a feature of the image. The matrix overlays a section of the image and performs pixel-wise multiplication with all of the values at that location.

The results of the bit-wise multiplication are summed and put in the corresponding location of the feature map. It then shifts to another section of the image and repeats the process until it has traversed the entire image.

The data set contains 60,000 training images and 10,000 testing images. Here the data is split into training and testing datasets respectively. The `x_train` & `x_test` contains grayscale codes while `y_train` & `y_test` contains labels from 0-9 which represent the numbers.

Many machine learning algorithms cannot operate on label data directly. They require all input variables and output variables to be numeric.

AKASH KV

After the model is defined, we need to evaluate it using various accuracy metrics available from k-fold cross-validation to precision, recall or F1 score.

Find a way to upload or host the trained model in the cloud. So when a user inputs his drawing of a number, the web app would help recognize the number.

Create an editable canvas for the user to draw the numbers by utilizing the handlers available for the mouse and touch by knowing the mouse up, down, touch and leave.

SGD is the most basic form of GD. SGD subtracts the gradient multiplied by the learning rate from the weights. Despite its simplicity, SGD has strong theoretical foundations and is still used in training edge NNs.

RAJAI SHANKAR P

Optimizers are algorithms or methods used to change the attributes of your neural network such as weights and learning rate in order to reduce the losses.

How you should change your weights or learning rates of your neural network to reduce the losses is defined by the optimizers you use. Optimization algorithms or strategies are responsible for reducing the losses and to provide the most accurate results possible.

Through conventional wisdom suggests that, Adam does not require tuning, we find that tuning the initial learning rate and decay scheme for Adam yields significant improvements over its default setting over all cases.

Dimensionality reduction is achieved using a sliding window with a size less than that of the input matrix. Which reduces the processing time of the CNN model.

Grouping

3

Group ideas

Take turns sharing your ideas while clustering similar or related notes as you go. Once all sticky notes have been grouped, give each cluster a sentence-like label. If a cluster is bigger than six sticky notes, try and see if you can break it up into smaller sub-groups.

🕒 20 minutes



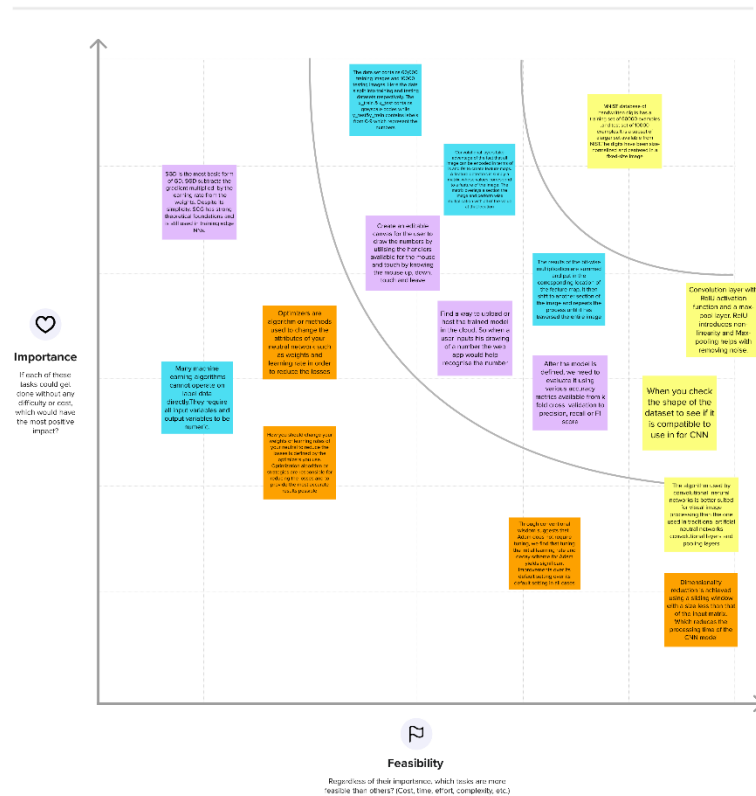
Step-3: Idea Prioritization

4

Prioritize

Your team should all be on the same page about what's important moving forward. Place your ideas on this grid to determine which ideas are important and which are feasible.

20 minutes



→

After you collaborate

You can export the mural as an image or pdf to share with members of your company who might find it helpful.

Quick add-ons

- Share the mural**
Share a view link to the mural with stakeholders to keep them in the loop about the outcomes of the session.
- Export the mural**
Export a copy of the mural as a PNG or PDF to attach to emails, include in slides, or save in your drive.

Keep moving forward

- Strategy blueprint**
Define the components of a new idea or strategy.
[Open the template →](#)
- Customer experience journey map**
Understand customer needs, motivations, and obstacles for an experience.
[Open the template →](#)
- Strengths, weaknesses, opportunities & threats**
Identify strengths, weaknesses, opportunities, and threats (SWOT) to develop a plan.
[Open the template →](#)

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