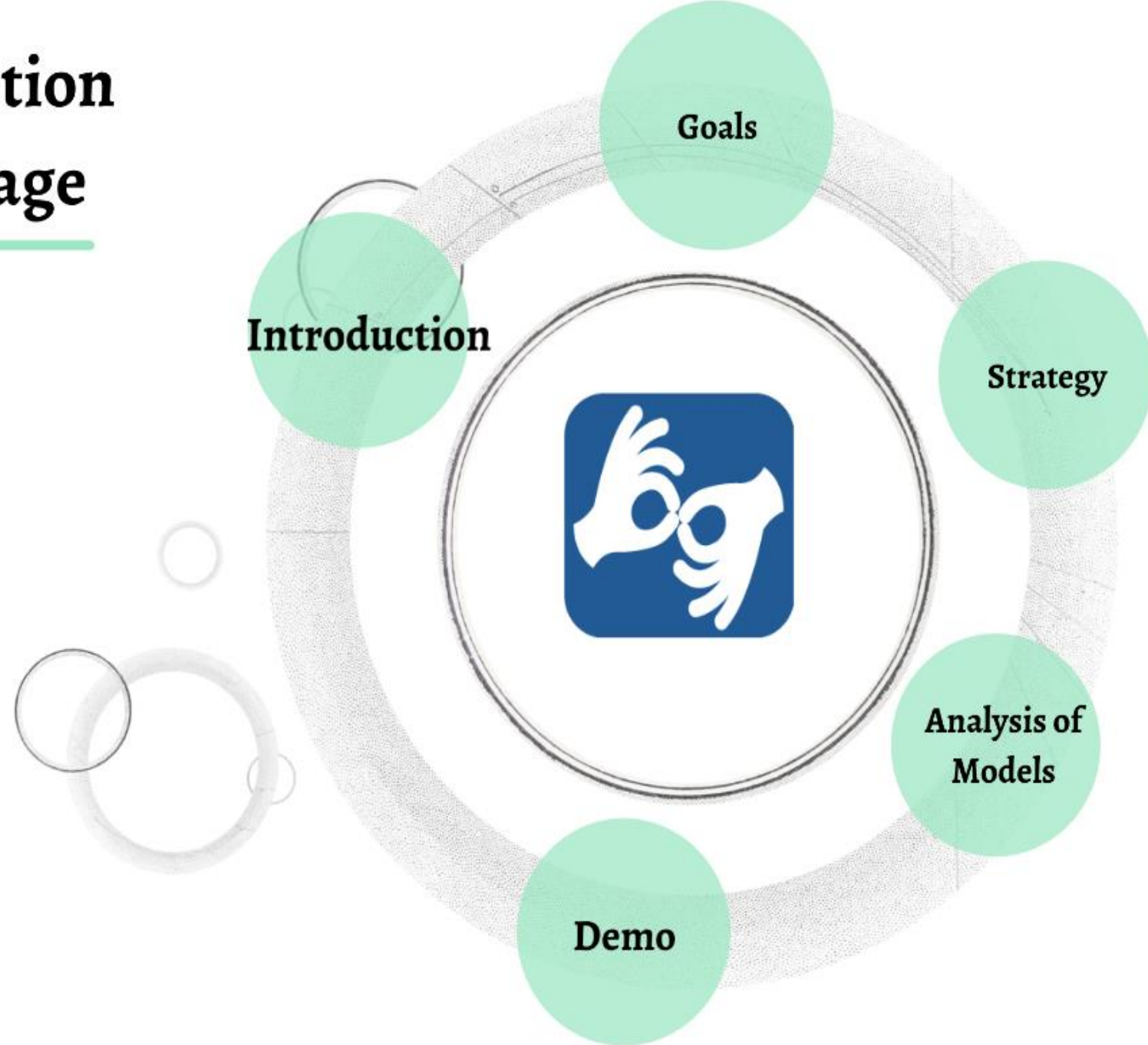


# Real Time Interaction using Sign Language

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Team 9 (Jai , Nikhil , Dwana)



# **Interpretation of Sign Language to Text & Speech and Interaction with a Virtual Assistant**

With this project, we propose a Computer Vision based model that recognizes ASL Letter and few specific words; and convert sign language to text & Speech Deep Neural Networks so that deaf people can communicate with other people in an effective way.

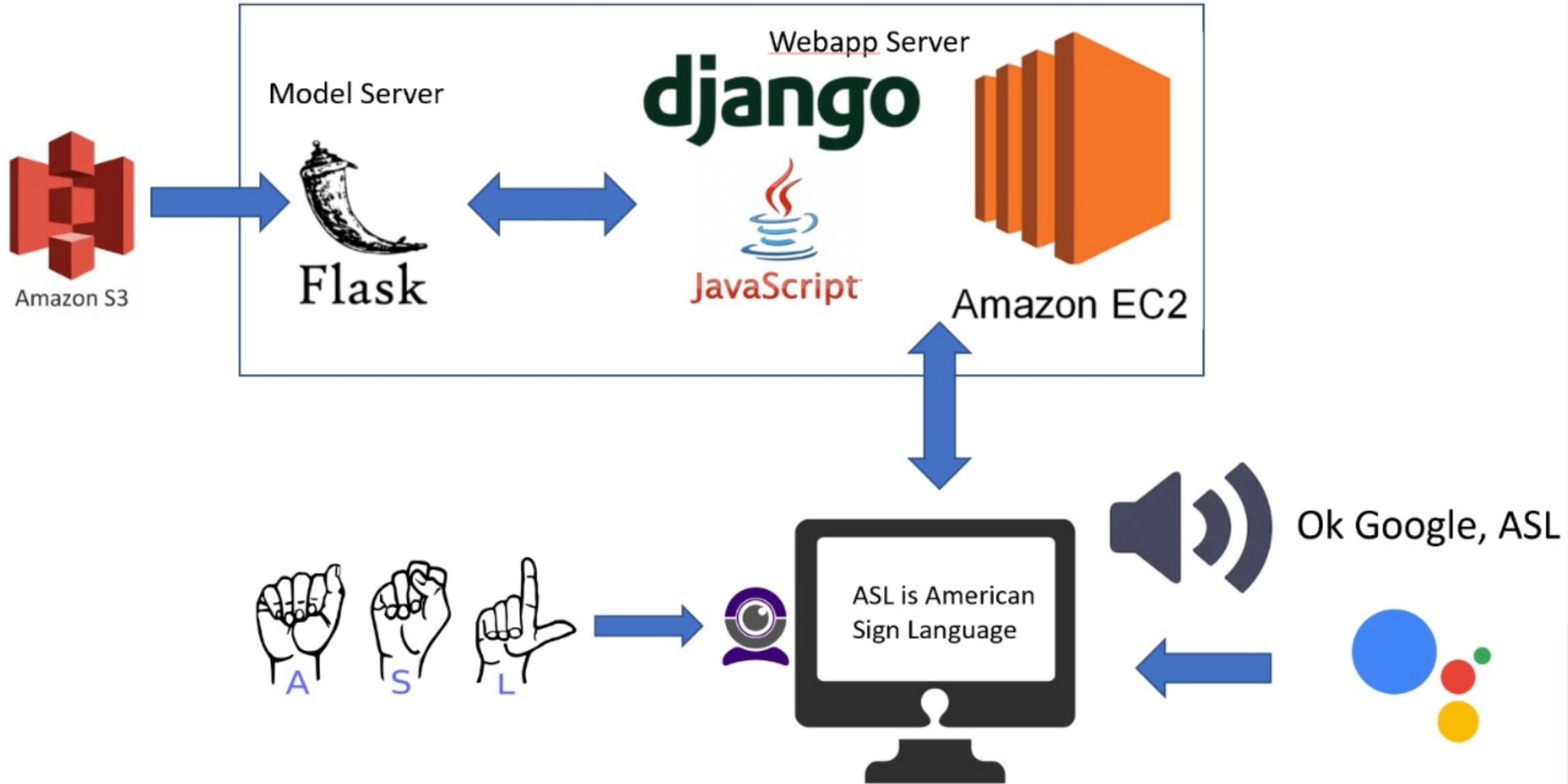
# Goals

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1. To recognize and interpret Sign from a Video/Web-cam
2. Convert the interpreted text into Speech
3. A speech to text system to transcribe the response
4. Providing the accuracy of the predicted text
5. Implementing the entire model in Keras/Tensorflow



# APPLICATION ARCHITECTURE



# Models Used



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Inception V3  
(CNN) + LSTM

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Time Distributed CNN

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Transfer Learning (VGG, Mobile  
Net, Inception)

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Image Transformations

# Transformation Applied

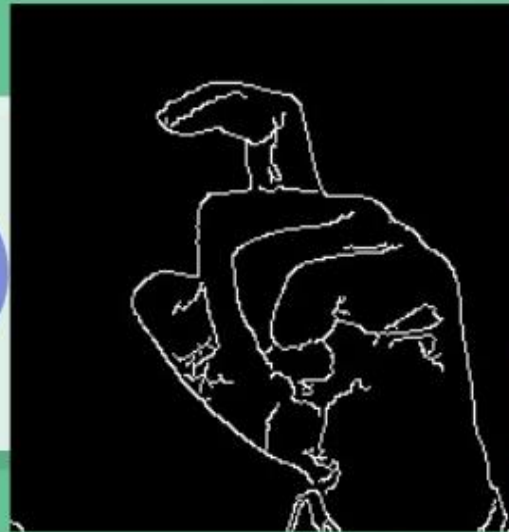
Optical Flow



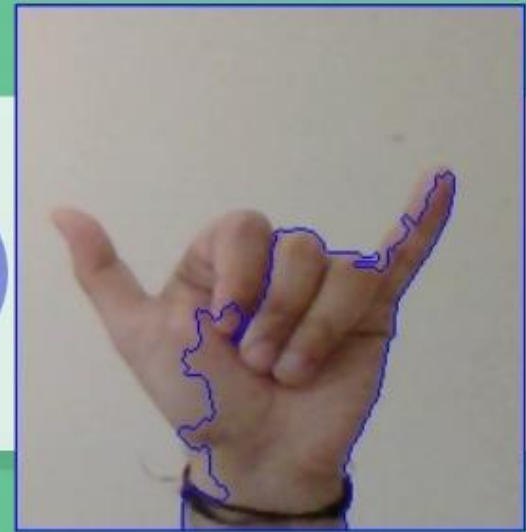
Morphological



Canny Edge



Watershed Algo





# Analysis of Models:

Problem	Model Type	Transformation Applied	Training Accuracy	Testing Accuracy
LSA64 Video Recognition	CNN(inception v3) LSTM	NA	96	95
LSA64 Video Recognition	Time distributed CNN (LRCN)	NA	45	40
Words 224 Recognition	CNN	Grayscale	99.9	99
Words 224 Recognition	Transfer Learning VGG	Canny Edge Detection	99.8	99.5
Words 224 Recognition	Transfer Learning Mobilenet	Morphological	99.4	50.2
Alphabet 224 Recognition	CNN Simple	Grayscale	99.8	99.5
Alphabet 224 Recognition	Transfer Learning mobilenet	Grayscale	99	74

# Future Goals

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Our future goal in the coming months is to try and implement continuous recognition of Sentences using Sign Language as it is still a Research Topic and it has many complex issues such as Lightening conditions of the user, Different shapes and movements.

We will implement this using Optical Flow in the future.



# Q & A

[https://youtu.be/  
y\\_XD36URZlY](https://youtu.be/y_XD36URZlY)

Any Questions?