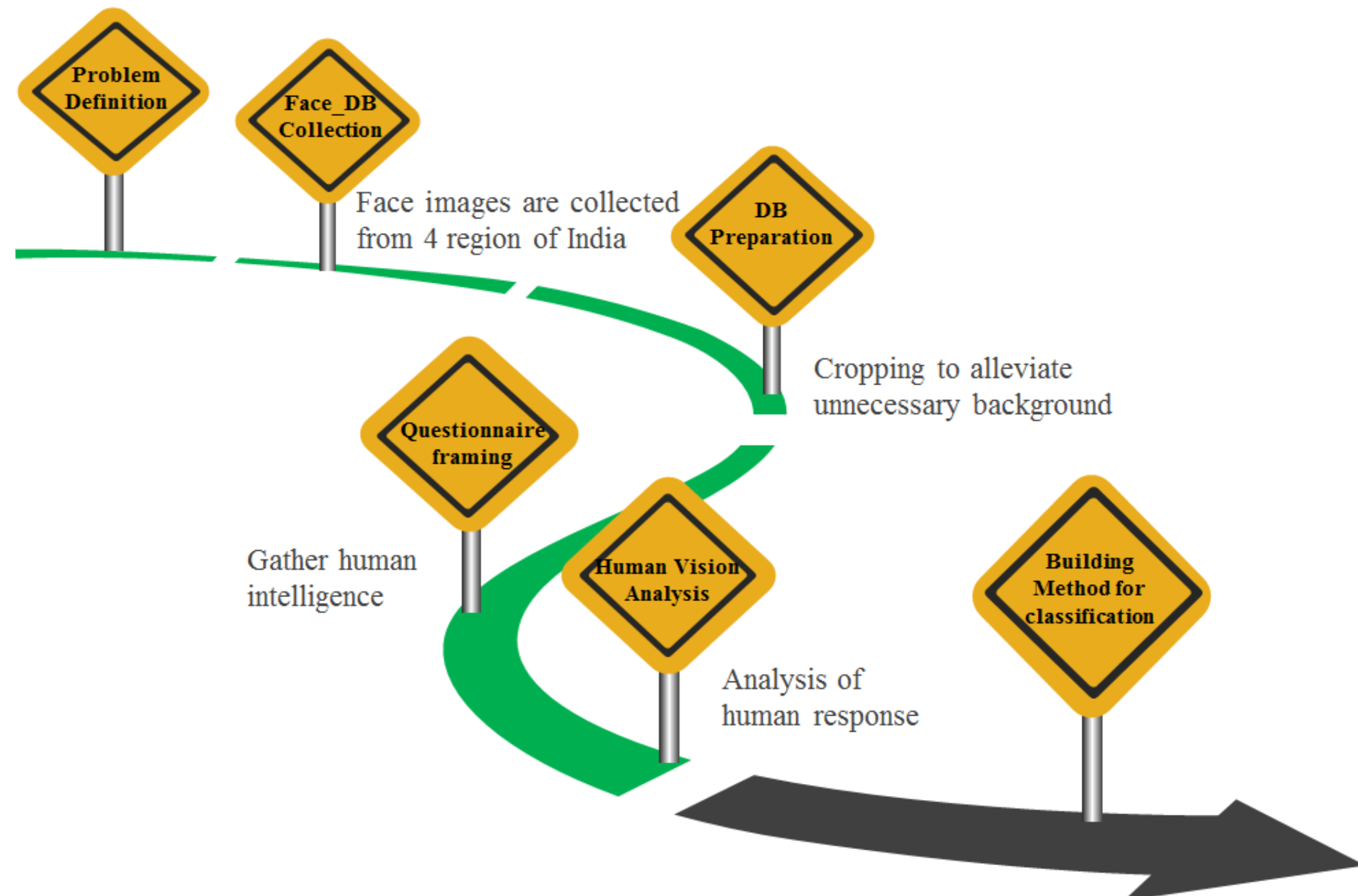




# Analysis of Human Intelligence in Identifying Persons Native through the Features of Facial Image

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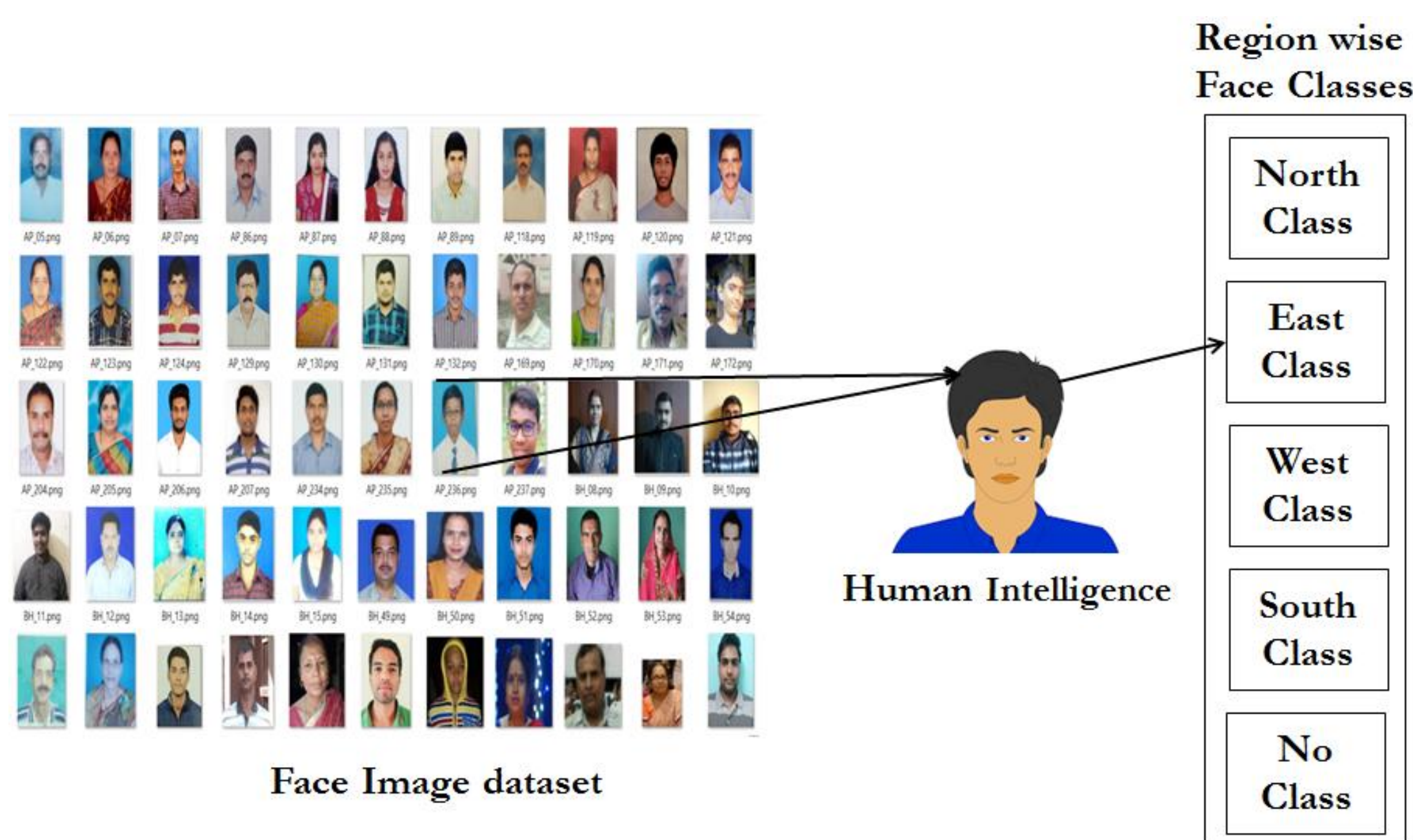
## Route Map



## Problem statement

In computer vision Image Classification is a challenging task and at present its accuracy is not high enough because of large number of redundant information and features. Hence primary focus should be on how human intelligence works on image classification rather than training the machine for the image classification. So to strengthen classification, a new approach of classifying a person geographical region wise based on facial feature is addressed by inculcating human intellect.

## Proposed human intelligence system



## Face database

A sample of 254 images are shown below



## Challenges with Face DB

Following are the challenges observed while primary survey:

- Pose variation
- Illumination
- Low resolution
- Non-uniform background and
- Old photos
- Cropped images from group photo
- Photo copy of photos
- Region non-convincing

## Questionnaire form

Questionnaire regarding how you are identifying person

Is image of a person shown to you is adequate for identification?

Yes b) No c) Moderate

Answer:

What factor would make image more clear/adequate for identification?

Image is adequate b) Pose of image c) Illumination d) Uniform background

Answer:

What is the gender of a person in image?

Female b) Male

Answer:

Is image of person accommodated with any regional accessories or giving any indication?

Yes b) No c) Moderate

Answer:

Which feature do you find more prominent in image? Eyes b) Nose c) Mouth d) Face shape e) if other please specify

Answer:

What do you think to which region of India, this person in image belong to?

North b) East c) West d) South

Answer:

What do you think which state does the person in image belong to?

Answer:

What made you to decide a person in image belong to particular state or region?

Answer:

Any other observation?

Answer:

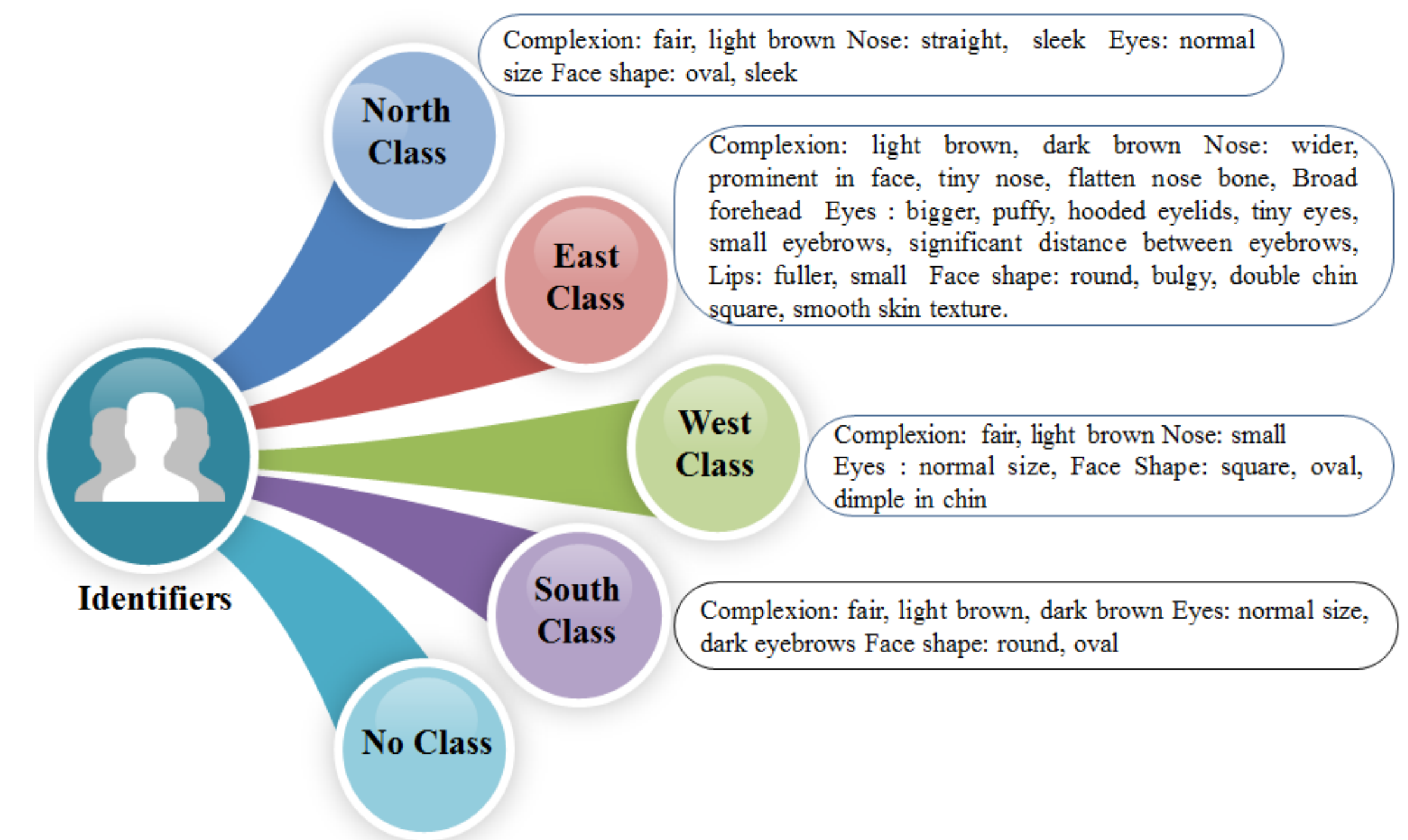
Disclaimer: I filled this form truly on my observation of face image provided at time, with no intervention of any.

Sign:

## Response Sheet

		Facial features							Non Facial Feature				Region		Identified			
Identifier	St	Person	Nose	Eyes	Forehead	Face shape	Mouth	Skintone	Moustach	Vermilion	Amulet Thread	Appearance	Actual	Identified	TRUE	FALSE	Over all	of same region
Reddy AP	8 BH					Face shape							East	East	TRUE			
Reddy AP	9 BH	Nose											East	North		FALSE		
Reddy AP	16 JH					Face shape							East	South		FALSE		
Reddy AP	17 JH					Face shape				Vermilion		Saree Style	East	South		FALSE		
Reddy AP	145 RJ					Face shape		Skintone					North	North	TRUE			
Reddy AP	60 MH	Nose							Moustach				West	South		FALSE		
Reddy AP	136 TL					Face shape		Skintone		Moustach			South	South	TRUE			
Reddy AP	137 TL		Eyes							Vermilion			South	South	TRUE			
Reddy AP	5 AP						Mouth		Moustach				South	South	TRUE			
Reddy AP	6 AP					Face shape							South	South	TRUE		(6/10)	(4/4)
Vidyal BH	3 UP		Eyes			Face shape					Amulet Thread		North	East		FALSE		
Vidyal BH	4 UP					Face shape							North	East		FALSE		
Vidyal BH	10 BH	Nose											East	East	TRUE			
Vidyal BH	11 BH	Nose				Face shape							East	East	TRUE			
Vidyal BH	12 BH					Face shape							East	East	TRUE			
Vidyal BH	18 JH		Eyes			Face shape							East	East	TRUE			
Vidyal BH	19 JH		Eyes			Face shape							East	East	TRUE			
Vidyal BH	138 TN		Eyes										South	North		FALSE		
Vidyal BH	7 AP	Nose				Face shape							South	South	TRUE			
Vidyal BH	86 AP		Eyes			Face shape			Moustach				South	South	TRUE		(7/10)	(5/5)
Pradep JH	1 UP	Nose				Face shape							North	North	TRUE			
Pradep JH	2 UP	Nose		Forehead									North	North	TRUE			
Pradep JH	12 UP		Eyes			Face shape							East	East	TRUE			

## Summary of response sheet



## Performance Evaluation

$$GAR = \frac{\text{Number of correctly identified faces}}{\text{Total number of face images}} \times 100\%$$

$$FAR = \frac{\text{Number of wrongly identified faces}}{\text{Total number of face images}} \times 100\%$$

- GAR of approximate 96% is achieved when both identifier and person in image share same region.

## Human intelligence performance

User No (of region)	No.of correctly identified out of all regions	No.of correctly identified out of same region	Frequent traveller	FAR % over all	GAR % overall	FAR% Same region	GAR % Same region
1 AP	6/10	4/4	Y	40%	60%	-	100%
2 BH	7/10	5/5	Y	30%	70%		100%
3 JH	9/10	4/5	Y	10%	90%	20%	80%
4 KA	7/10	3/3	Y	30%	70%		100%
5 KA	5/10	3/3	N	50%	50%		100%
6 KA	7/10	3/3	Y	30%	70%		100%
7 KA	3/10	3/3	N	70%	30%		100%
8 KA	6/10	3/3	N	40%	60%		100%
9 KA	4/10	3/3	N	60%	40%		100%
10 BH	6/10	5/6	Y	40%	60%	16.7%	83.3%
11 BH	8/10	7/8	N	20%	80%	12.5%	87.5%
12 KA	4/10	1/1	N	60%	40%		100%
13 KA	6/10	3/3	N	40%	60%		100%
14 AP	3/10	2/2	N	70%	30%		100%
15 OD	9/10	6/6	Y	10%	90%		100%
16 KA	7/10	3/3	Y	30%	70%		100%
17 MH	6/10	1/1	Y	40%	60%		100%
18 UP	5/10	2/2	N	50%	50%		100%
19 KA	5/10	1/1	N	50%	50%		100%
20 BH	8/10	4/5	Y	20%	80%	20%	80%
21 BH	8/10	6/7	Y	20%	80%	14.3%	85.7%
22 MH	6/10	Nil	Y	40%	60%	Nil	Nil

## CONCLUSION

An understanding of human visual processes involved in image classification can facilitate and, in turn be facilitated by, better computational models. Proposed approach aimed to gather intellect of human in identifying and classifying person to his class of region through his prominent features and explore human capability of understanding Indian literacy. These findings provide insights into the nature of cues that the human visual system relies upon for achieving its impressive performance and serve as the building blocks for efforts to artificially emulate these abilities.