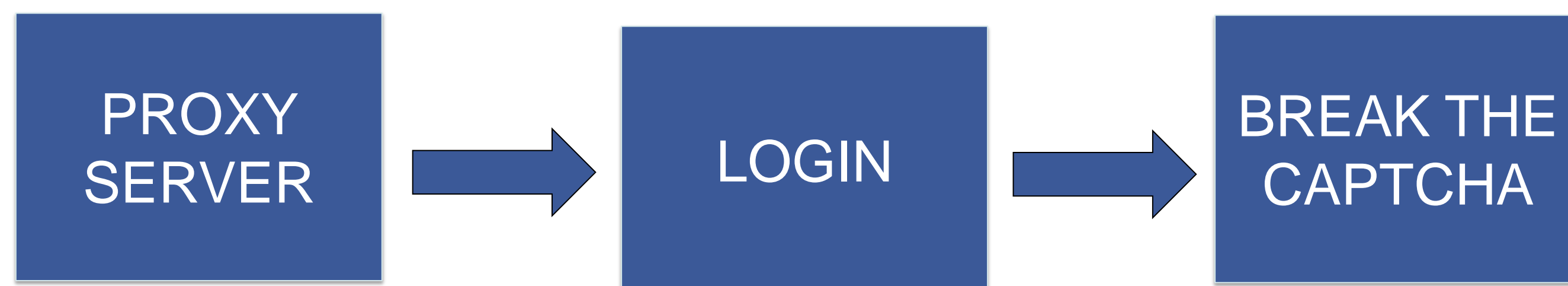# Evaluating Facebook's Next Generation Captcha

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## Aim of the study

- 👍 Evaluate the effectiveness of Facebook's social captcha
- 👍 Find shortcomings of the captcha
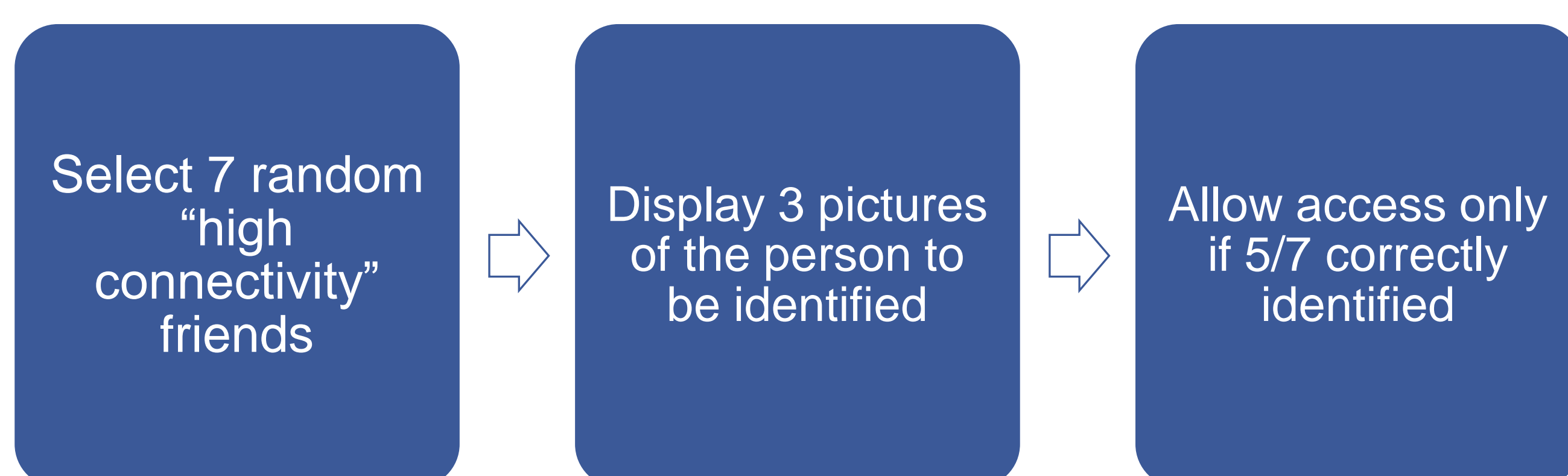- 👍 Suggest improvements for the captcha.

## Experimental Setup

PROXY SERVER → LOGIN → BREAK THE CAPTCHA

## Data Collection

| Attaker | Account Attacked | Closeness | Total Friends | Mutual Friends | Fraction of MF | Correct responses | Failed/Cleared |
|---|---|---|---|---|---|---|---|
| Surbhi Jain | Abhinav Kapoor | 5 | 394 | 98 | 0.248730964 | 4 on 5 | Failed |
| Priyanshi Mittal | Surabhi Kabra | 3 | 681 | 276 | 0.405286344 | 4 on 5 | Cleared |
| Priyanshi Mittal | Vibhas Kumar | 5 | 681 | 235 | 0.345080764 | 5 on 5 | Cleared |
| Surabhi Kabra | Salil Lalit | 5 | 670 | 109 | 0.162686567 | 4 on 5 | Cleared |
| Surabhi Kabra | Priyanshi Mittal | 3 | 670 | 276 | 0.411940299 | 4 on 5 | Failed |
| Raghav Sethi | Mayank Pundir | 5 | 592 | 225 | 0.380067568 | 5 on 6 | Cleared |
| Mayank Pundir | Mehak Soni | 5 | 579 | 223 | 0.385146805 | 5 on 5 | Cleared |
| Nishtha Khanna | Shiva Lawaria | 5 | 429 | 120 | 0.27972028 | 2 on 7 | Failed |
| Shiva Lawaria | Nishtha Khanna | 5 | 350 | 120 | 0.342857143 | 5 on 5 | Cleared |
| Abhinav Kapoor | Surbhi Jain | 5 | 236 | 98 | 0.415254237 | 4 on 6 | Failed |

*Fig1 : Screenshot of data, collected from 40 people*

## How facebook does it

Select 7 random "high connectivity" friends ⇨ Display 3 pictures of the person to be identified ⇨ Allow access only if 5/7 correctly identified
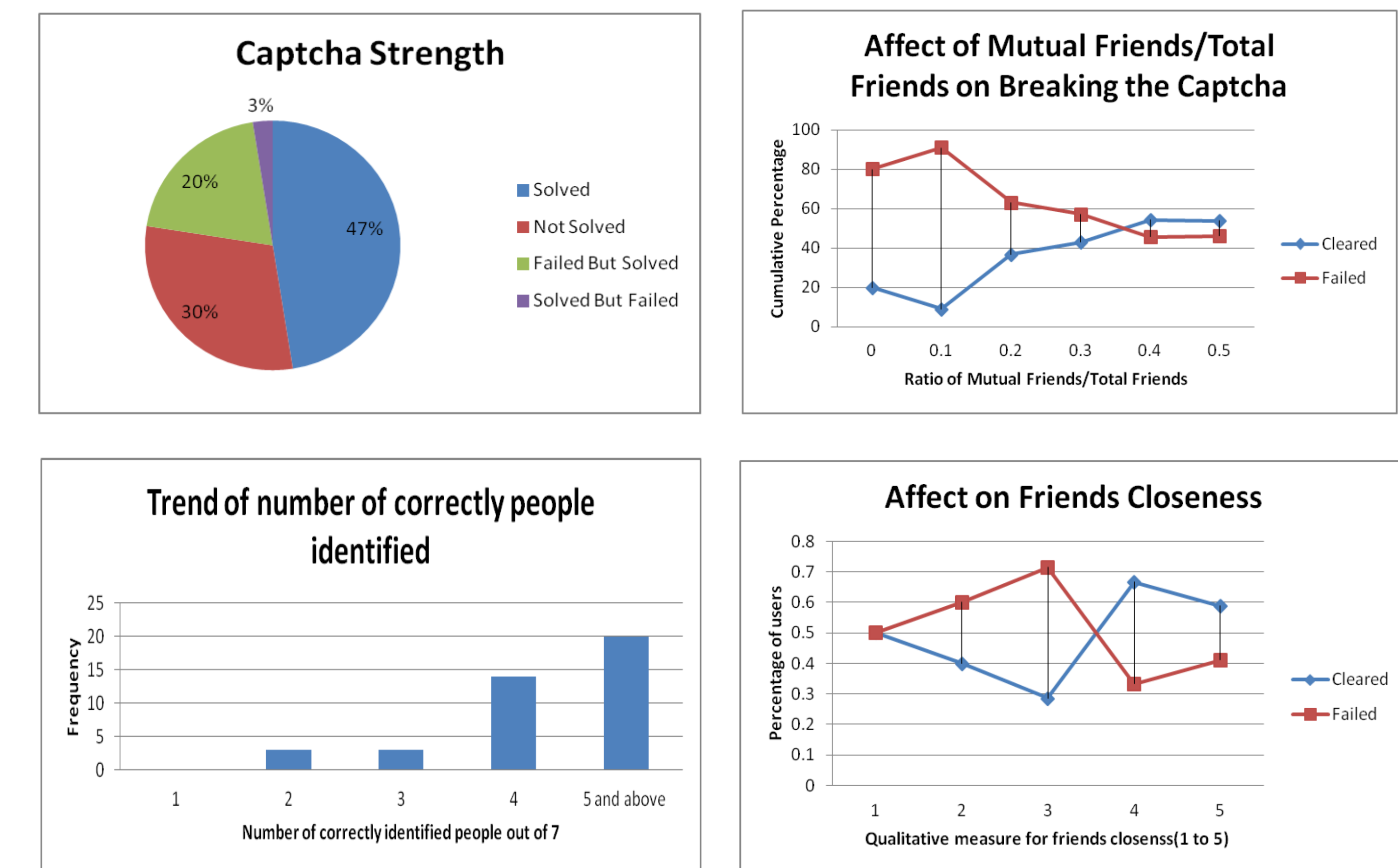
## Observations

- 👍 One go at solving captcha per hour
- 👍 All options have the same gender
- 👍 There is a time limit to solve the captcha
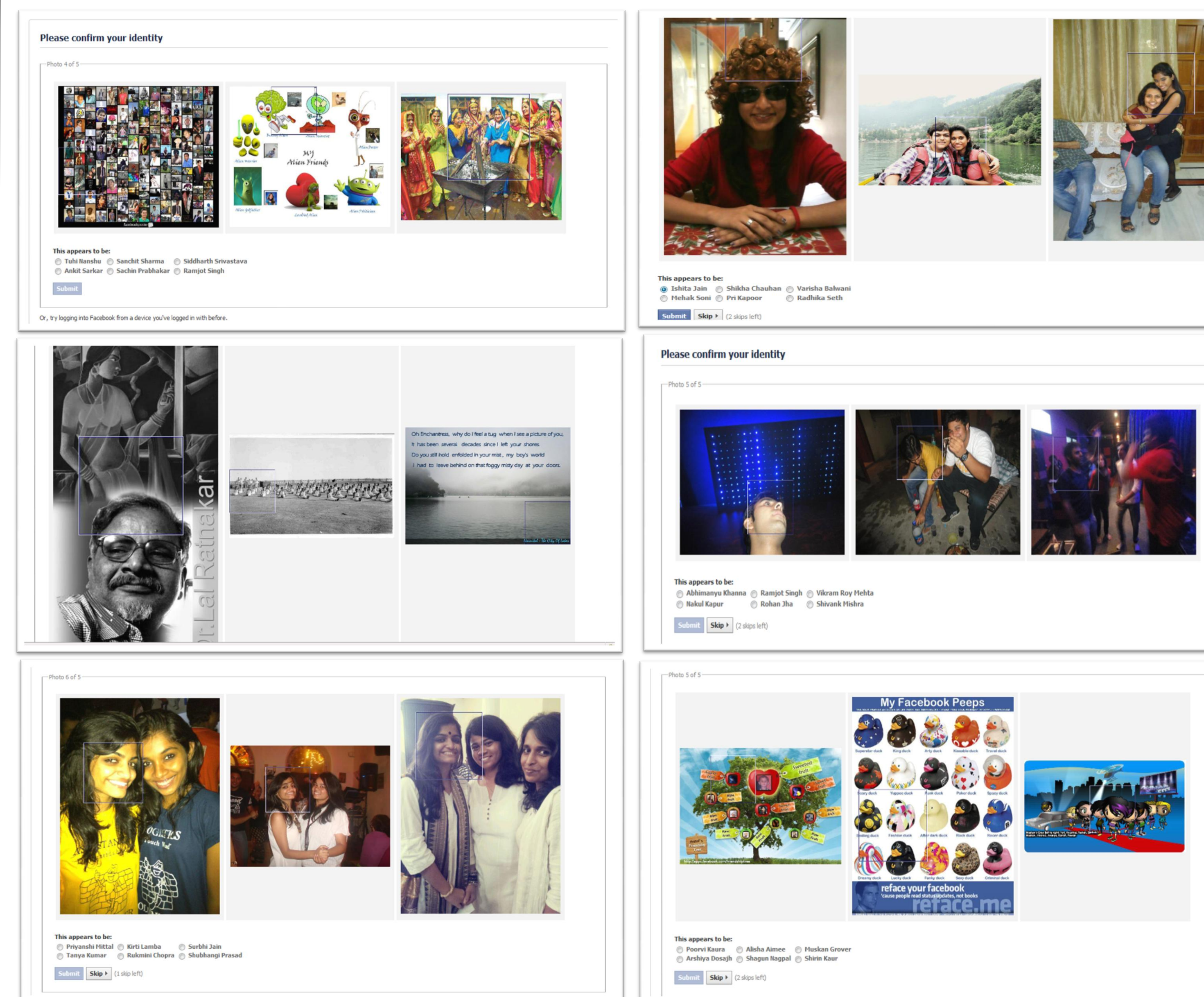


- 👎 None of the pictures has faces
- 👎 Captcha not generated every time
- 👎 Repeat trial pops the same set of people
- 👎 Even 3 or 4 correct answers give access
- 👎 Strongly connected friends are asked to be identified
- 👎 Guesses also effective (38% success )
- 👎 Profile pictures also shown

## Analysis and Results



Captcha Strength — Solved 47%, Not Solved 30%, Failed But Solved 20%, Solved But Failed 3%

Affect of Mutual Friends/Total Friends on Breaking the Captcha

Trend of number of correctly people identified

Affect on Friends Closeness

## Scope for Improvement

- 👍 Use of face recognition techniques
- 👍 Increase the options to avoid guessing
- 👍 Avoid popping publically visible pictures
- 👍 Identify people from diverse network and location
- 👍 Unique people popped for every try
- 👍 Pictures liked by the user must be preferred