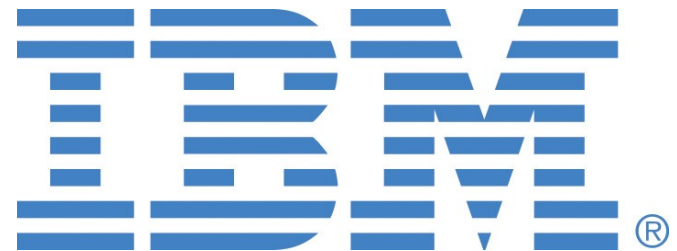
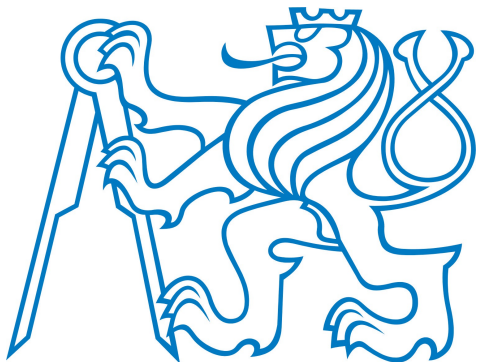


IBM Presence detection

Milan Stezka (stezkmil@fel.cvut.cz)



Introduction

- Task:
 - Design and realize an extension to the Smart Kiosk project which will detect presence of a person.
 - Utilize the OPENCV library and a camera.
 - Part of the design will be a scenario taking advantage of this information.



Why we do this?

- To explore new ways of user identification.
- This should result in an improved user experience with the Smart Kiosk.



Main window

Detekce přítomnosti osoby Ukončit program

Obraz snímáný kamerou




Status: Uživatel rozpoznán jako Milan Stezka

Přihlášení

Login:

Heslo:

 Přihlásit

 Registrace nového uživatele



User registration

Registrace nového uživatele

Registrace nového uživatele

Povinné údaje


Jméno

Příjmení


Login

Heslo

Potvrzení hesla

 Vyfotit

Obraz snímáný kamerou



OK Cancel

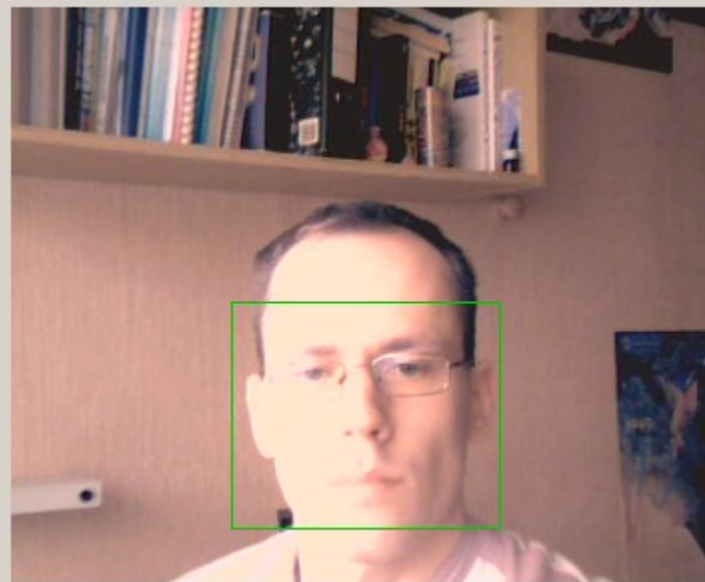


Difficult cases of face recognition

Obraz snímaný kamerou



Status: Nebyl detekovan zadny uzivatel

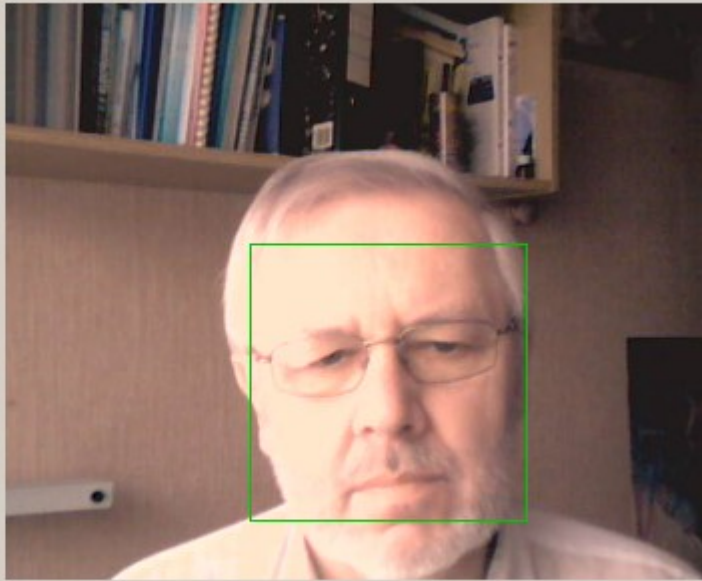


Status: Neznamy uzivatel

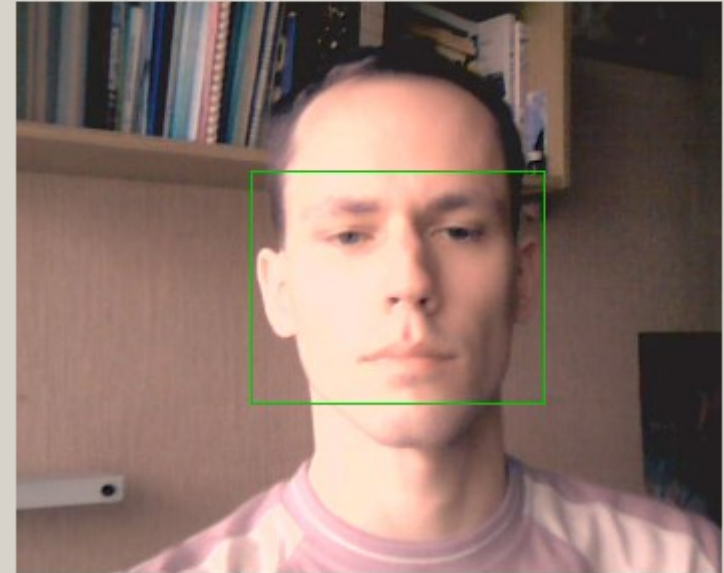


Successful cases of face recognition

Obrázek snímáný kamerou



Status: Uzivatel rozpoznán jako Jiri Stezka

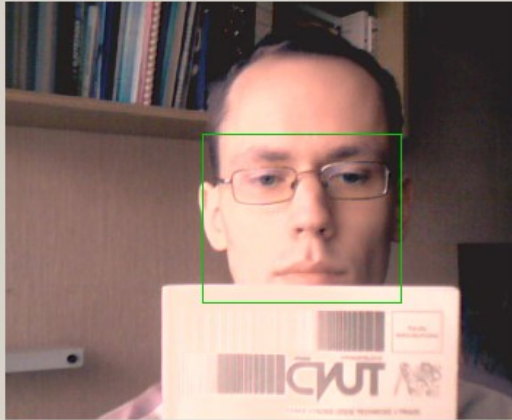


Status: Uzivatel rozpoznán jako Milan Stezka

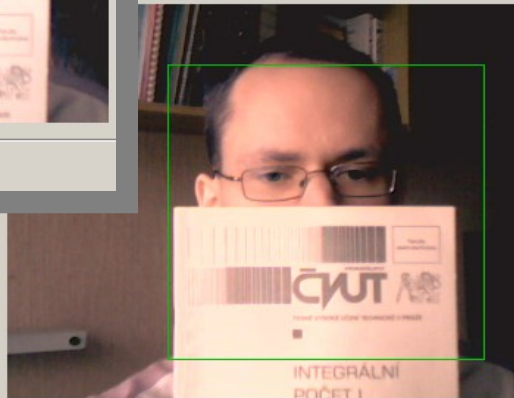


Partially hidden face cases

Obrázek snímáný kamerou



Status: Uživatel rozpoznán jako Milan Stezka



Status: Neznámý uživatel

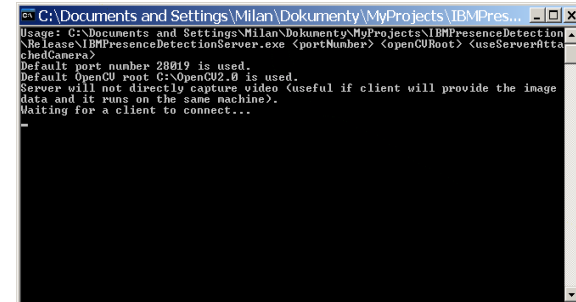


Status: Nebyl detekován žádný uživatel

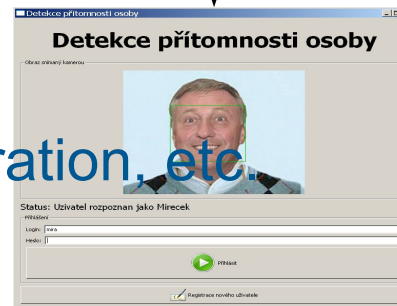


Task distribution

- **Server:**
 - Receives image data from clients
 - Performs face detection and recognition
 - Holds user registration data
 - Sends recognition results to clients
- **Client:**
 - Displays the results
 - Shows forms for login, registration, etc.



```
C:\Documents and Settings\Milan\Documents\MyProjects\IBMPres...
Usage: C:\Documents and Settings\Milan\Documents\MyProjects\IBMPresenceDetection
\Release\IBMPresenceDetectionServer.exe <portNumber> <Open(C)Root> <UseServerDit
chedCamera>
Default port number 28019 is used.
Default OpenCV root C:\OpenCV2.4 is used.
Server will not directly capture video (useful if client will provide the image
data and it runs on the same machine).
Waiting for a client to connect...
```



Conclusion

- Methods used
 - Face detection: Viola and Jones (based on Haar wavelets)
 - Face recognition:
 - Eigenfaces
 - Principal Component Analysis (PCA)
- Reasonably stable lighting conditions are required
- At least 2 faces in database are required
- Does not work with distant and/or partially covered faces

