# Face and Frame Classification using Geometric Features

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a) b) c) d) e) f) g) h) i)
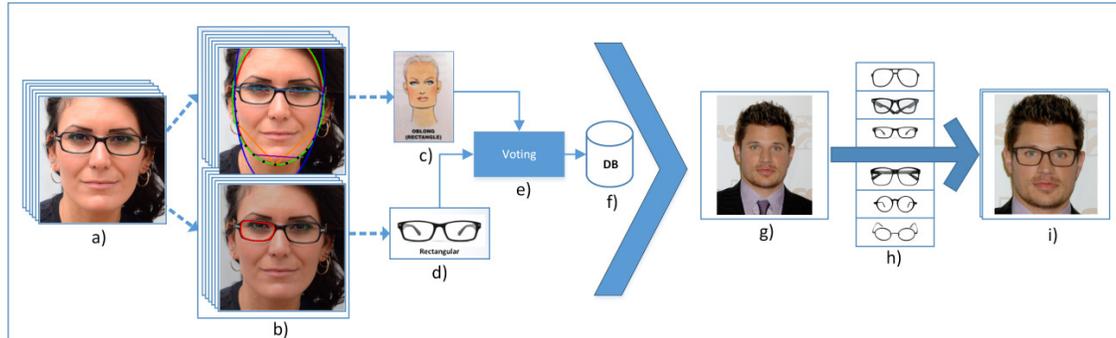
**Partner institution :**

**CONCORDIA UNIVERSITY**

## BACKGROUND

Eyeglasses have become fashion items with iconic designs and an overwhelming supply of frames available in both online and tradition retail stores, opening the path to many commercially available frame recommendation systems. Most current recommendation systems, however, are generally procedural, based on some a priori aesthetic rules that do not take into account current fashion, age, or culture.

## TECHNOLOGY

Concordia University researchers have created for the first time an automatic data-driven eyewear recommendation engine that requires no user interaction. Using machine-learning techniques, the novel recommendation engine learns from on-line surveys and/or past purchases to determine the best correlation between face and eyewear shapes to make personalized recommendations based on face shape classification.

## COMPETITIVE ADVANTAGES

The two distinguishing contributions of this method are the automatic classification of the face and frames. For the frames, given a single image the system automatically and robustly extracts the polygon corresponding to the frames with more accuracy than the state of the art method. The system then classifies the frames into one of the six frame types: oval, rectangular, square, aviator, wayfarer. The classification accuracy is 90%. For the face, using a face tracker, the system identifies the salient geometric features such as the roundness of the face, the size of the chin, the distance between the eyes, etc. It uses these features to classify the face as one of the 6 standard face types: round, oval, square, oblong, heart and diamond.

## TECHNOLOGY DEVELOPMENTAL STAGE

The system has been implemented on a desktop computer. This prototype is used to collect 240 pictures of subjects who wear glasses and record votes from 80 people. This prototype database was used for the recommendation system.

For validating the recommendation engine, a set of pictures of individuals without glasses is used by presenting 4 different types of frames using Concordia's own virtual try-on application. 2 frames were the ones that the recommendation system selected and 2 selected at random. 42 participants were asked to select their favourite frame. 82% of the times the selection made coincided with one of our recommendation

## APPLICATIONS

The immediate application of this technology is to be integrated with a virtual try-on system for recommending the best frame for a customer depending on his/her face and the current fashion trends in a certain culture. This technology can therefore be trained to help massive adoption of a new frame line.

## IP STATUS

U.S. provisional patent

## BUSINESS OPPORTUNITY

We are currently looking for frame designers/manufacturers that can integrate the technology into their virtual try-on system and make it available to their distribution channels.