Driver Licensing: Keeping up with Changing Demographics

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Driver licenses and non-driver ID cards are printed with information such as a photo, name, address, gender and date of birth. These documents are used to verify age, address and identity as well as serve as driving privileges in the case of the DL. Photos on the license should be a reflection of the individual. How can government agencies keep up with population demographic changes? Is it permissible for people to alter their appearances for driver license and non-driver ID card photos (e.g., heavy make-up) to the point of changing facial recognition points? How are the inconsistencies with the license photo managed?
Photo Polices in Texas
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Transgender applicants living fulltime as the opposite sex will be photographed to reflect the appearance of this person as they represent themselves in their daily lives.
Religious headwear or chemo scarves are acceptable:

- as long as applicant’s eyes, nose, mouth, ears, and chin are visible and free of shadows
NAME: [Redacted]

ADDRESS: [Redacted]

DATE OF BIRTH: [Redacted]
SEX: M
HEIGHT: 6'01"
EYE COLOR: BR

EXPIRATION DATE: 09-16-2017
ISSUANCE DATE: 08-20-2013

DU/ID/UNL NUMBER: [Redacted]
Religious headwear does not include:

- a ball cap or hat for a sports team or business
- a cowboy hat
- a colander, spaghetti strainer, or any other kitchen hardware
10. Wearing a colander on your head for your driver’s license photo

You won’t be arrested, but you won’t necessarily be allowed to get your driver’s license if you show up with a colander on your head. It all depends on your state and its stance on the Church of the Flying Spaghetti Monster and its members, who are known as Pastafarians.

Recently a woman in Utah was allowed to wear a colander on her head for her driver’s license photo. Headgear and hats are not normally allowed for photos, but there is an exception for religious garments. Utah has recognized the Pastafarians’ church as a religion, so she was allowed to wear the colander as a religious statement.

In Illinois, a gentleman wasn’t as lucky when he tried wearing a colander for his driver’s license photo last year. While state laws allow for religious head dressings that don’t cover any areas of the face, the state found the headgear to be satirical and not religious. A senior legal advisor for the state said that wearing the headgear was a form of free speech, but so is giving the finger, which also isn’t allowed for a driver’s license photo.
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Face Recognition and Appearance Variations

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Facial recognition (or face recognition) is a type of biometric software application that can identify a specific individual in a digital image by analyzing and comparing patterns. Facial recognition systems are commonly used for security purposes but are increasingly being used in a variety of other applications.
Brief History of Face Recognition

- **1966** Bledsoe, Chan and Bisson
  - 'It really worked!'
- **1973** Kanade
  - The first fully automated system
- **1997** Visionics
  - The first commercial release
- **1998** Polaroid
  - First use in production DMV systems
- **2004** Identix
  - US Government use for Visa applicants
Use Cases

• De-duplication & Fraud Prevention
  – NY DMV: led to more than 2,500 arrests, including fugitives and terrorists
  – Passport & Visa
  – Mugshots

• Investigative Search
  – Not ideal, yet still some success: Pinellas County, FL, face match to social media ID’ed armed robber
State of the Art in Accuracy

Error has been reduced from 79.0% to 0.3% over the last 20 years. (beating Moore’s law)

From NIST IR 7709 (2010)
Algorithms are as good or better than humans. However... pose, lighting, expression, and other variations still affect accuracy.
How It Works

- **Enrollment** of Probe and Gallery
  1. Detection
  2. Registration
  3. Feature Extraction & Quality
- **Match** between Probe and Gallery to create similarity score
- Human intervention can be applied to any step to help the algorithm
Non-Ideal Cases


**Similar results to Human Perception**

Automated Face Recognition is a mature technology, yet accuracy is dependent on variations in:
- Lighting
- Expression
- Pose
- Occlusions (including Makeup)
- Camera Equipment

Face enrollment policies must balance the tradeoff between accuracy (enforcing consistent enrollments) and end user convenience.
Questions