THE POWER OF VISUAL DATA

Shasha Lu
The “Big Data” Trend

Source: IDC, 2014
What makes big data big?

In 1 minute……

**Youtube** 700,000 hours of videos watched and 500 hours of videos uploaded

**Facebook** 243,000 photos uploaded and 70,000 hours of video content watched

**Instagram** 65,000 photos uploaded

**Netflix** 87,000 hours of videos watched

**Tinder** 1,000,000 swipes and 18,000 matches

**Whatsapp** 1,000,000 photos shared

… …

Source: [https://www.go-globe.com/blog/things-that-happen-every-60-seconds/](https://www.go-globe.com/blog/things-that-happen-every-60-seconds/) 2017
Strength of The ‘New’ Data

<table>
<thead>
<tr>
<th>Quality</th>
<th>Rating</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excellent</td>
<td>✔️</td>
<td>80%</td>
</tr>
<tr>
<td>Very good</td>
<td>✔️</td>
<td>14%</td>
</tr>
<tr>
<td>Average</td>
<td>▲</td>
<td>4%</td>
</tr>
<tr>
<td>Poor</td>
<td>▼</td>
<td>1%</td>
</tr>
<tr>
<td>Terrible</td>
<td>▼</td>
<td>1%</td>
</tr>
</tbody>
</table>

605 reviews

As exquisite and memorable as a dining experience can ever be

This is a paradise for perfectionists, as least from a consumer side :). The place is perfect in any aspect: food, service, atmosphere, surrounding. But I find it even more fascinating for its century-long story. Being originally just a small restaurant on the river in... More

Which part is structured data? Why is it useful? What problems it may have?

Which part is unstructured data? Why is it useful?
Customer comments
Tweets
Forum discussions
Photo posts
Video posts
(Visual) content marketing
In-store shopping behavior
… ...

Gain customer insights
Understand customer preference
Improve customer experience
Discover unmet needs
Generate new product/business ideas
Measure and optimize marketing effectiveness
Use face analytics to improve business practice
What can you tell from a face?
Information from a Face

Demographics (age, gender, ethnicity, height, weight, …)?
Background (education, occupation, )?
Emotional states (joy, disgust, angry, …)?
Habits (smoking, drinking, stay up late, …)?
Traits (trustworthy, attractive, mature, …)?
Personality (extroversion, conservative, …)?
Behavioral tendency (risk seeking, leadership, competent… )?

What can we do with these information?
Can face reveal how long one will live?

**STEVE**
- Age: 38
- Perceived Age: 44
- BMI: #37.8
- Unhealthy
- Smoker: Yes

**BOB**
- Actual Age: 38
- Perceived Age: 36
- BMI: #23
- Healthy
- Smoker: No

Lifespan Estimate: 71.2

Lifespan Estimate: 84.6
How does it work?

**WHAT THE COMPUTER SAW BY REGION**

- **Forehead**
  - Perceived age: 44.3 years
  - 4.3 years less than actual age.
  - Horizontal creases and lines around the brow ridge are very common as skin loses elasticity.
  - Treated as 4.3 years younger than the perceived age.

- **Brow region**
  - Perceived age: 30.1 years
  - 10.1 years less than actual age.
  - Vertical lines appear between eyebrows in people who tend to furrow them. Lined and wrinkled skin is seen after lifting weights or doing squats.
  - Treated as 10.1 years younger than the perceived age.

- **Area around eyes**
  - Perceived age: 26.3 years
  - 3.7 years less than actual age.
  - Crows feet and bags below the eyes can begin to appear in the mid-20s. Shifting fat and loose skin make bags and fine lines appear.
  - Treated as 3.7 years younger than the perceived age.

- **Nose area**
  - Perceived age: 28.9 years
  - 1.1 years less than actual age.
  - The tip of the nose becomes more bulbous with age. Skin texture changes, pores enlarge, and women retain “bunny lines” on the sides of their noses.
  - Treated as 1.1 years younger than the perceived age.

- **Cheeks/jowls**
  - Perceived age: 26.4 years
  - 3.6 years less than actual age.
  - Once-cheeky, jowls start to sag. Curved lines form around the mouth. Wrinkles develop in the corners.
  - Treated as 3.6 years younger than the perceived age.

- **Mouth**
  - Perceived age: 25.1 years
  - 4.9 years less than actual age.
  - Collagen declines, making lips thinner. Mouths begin to droop at the corners. Vertical lines form above lips, particularly in women.
  - Treated as 4.9 years younger than the perceived age.

Tara Bahrampour
Bahrampour shows lower signs of aging around her eyes and forehead than expected for her age, said Karl Ricanek, a scientist behind FaceMyAge.com. Genes play a huge role in the appearance of aging.

46.9 years
47 years, 2 months

**Computer perceived age**

**Actual age**

- 27.4 years
  - 9 years, 6 months
  - Most common sign of aging.
  - Little change in skin.

- 25.1 years
  - 11 years, 3 months
  - Very high score. Only 25 years old.
  - Skin shows 11 years of aging.

- 28.9 years
  - 10 years, 4 months
  - Extremely high score. 28 years old.
  - Skin shows 10 years of aging.

- 30.1 years
  - 9 years, 11 months
  - High score. 30 years old.
  - Skin shows 9 years of aging.

- 32.2 years
  - 7 years, 3 months
  - High score. 32 years old.
  - Skin shows 7 years of aging.

- 34.3 years
  - 5 years, 5 months
  - High score. 34 years old.
  - Skin shows 5 years of aging.

- 36.4 years
  - 3 years, 11 months
  - High score. 36 years old.
  - Skin shows 3 years of aging.

- 38.5 years
  - 2 years, 2 months
  - High score. 38 years old.
  - Skin shows 2 years of aging.

- 40.6 years
  - 1 year, 11 months
  - High score. 40 years old.
  - Skin shows 1 year of aging.

- 42.7 years
  - 1 year, 3 months
  - High score. 42 years old.
  - Skin shows 1 year of aging.

- 44.8 years
  - 10 months, 2 weeks
  - High score. 44 years old.
  - Skin shows 10 months of aging.

- 46.9 years
  - 8 months
  - High score. 46 years old.
  - Skin shows 8 months of aging.

- 48.0 years
  - 6 months
  - High score. 48 years old.
  - Skin shows 6 months of aging.

- 50.1 years
  - 4 months
  - High score. 50 years old.
  - Skin shows 4 months of aging.

- 52.2 years
  - 2 months
  - High score. 52 years old.
  - Skin shows 2 months of aging.

- 54.3 years
  - 0 months
  - High score. 54 years old.
  - Skin shows 0 months of aging.

- 56.4 years
  - 8 weeks
  - High score. 56 years old.
  - Skin shows 8 weeks of aging.

- 58.5 years
  - 6 weeks
  - High score. 58 years old.
  - Skin shows 6 weeks of aging.

- 60.6 years
  - 4 weeks
  - High score. 60 years old.
  - Skin shows 4 weeks of aging.

- 62.7 years
  - 2 weeks
  - High score. 62 years old.
  - Skin shows 2 weeks of aging.

- 64.8 years
  - 0 weeks
  - High score. 64 years old.
  - Skin shows 0 weeks of aging.

- 66.9 years
  - 8 days
  - High score. 66 years old.
  - Skin shows 8 days of aging.

- 69.0 years
  - 6 days
  - High score. 69 years old.
  - Skin shows 6 days of aging.

- 71.1 years
  - 4 days
  - High score. 71 years old.
  - Skin shows 4 days of aging.

- 73.2 years
  - 2 days
  - High score. 73 years old.
  - Skin shows 2 days of aging.

- 75.3 years
  - 0 days
  - High score. 75 years old.
  - Skin shows 0 days of aging.

- 77.4 years
  - 8 hours
  - High score. 77 years old.
  - Skin shows 8 hours of aging.

- 79.5 years
  - 6 hours
  - High score. 79 years old.
  - Skin shows 6 hours of aging.

- 81.6 years
  - 4 hours
  - High score. 81 years old.
  - Skin shows 4 hours of aging.

- 83.7 years
  - 2 hours
  - High score. 83 years old.
  - Skin shows 2 hours of aging.

- 85.8 years
  - 0 hours
  - High score. 85 years old.
  - Skin shows 0 hours of aging.

- 87.9 years
  - 8 minutes
  - High score. 87 years old.
  - Skin shows 8 minutes of aging.

- 89.0 years
  - 6 minutes
  - High score. 89 years old.
  - Skin shows 6 minutes of aging.

- 91.1 years
  - 4 minutes
  - High score. 91 years old.
  - Skin shows 4 minutes of aging.

- 93.2 years
  - 2 minutes
  - High score. 93 years old.
  - Skin shows 2 minutes of aging.

- 95.3 years
  - 0 minutes
  - High score. 95 years old.
  - Skin shows 0 minutes of aging.

- 97.4 years
  - 8 seconds
  - High score. 97 years old.
  - Skin shows 8 seconds of aging.

- 99.5 years
  - 6 seconds
  - High score. 99 years old.
  - Skin shows 6 seconds of aging.

- 101.6 years
  - 4 seconds
  - High score. 101 years old.
  - Skin shows 4 seconds of aging.

- 103.7 years
  - 2 seconds
  - High score. 103 years old.
  - Skin shows 2 seconds of aging.

- 105.8 years
  - 0 seconds
  - High score. 105 years old.
  - Skin shows 0 seconds of aging.

**Robert Samuels**
*Facial age 29, 6 months younger than real age; 29 years, 9 months*

*FaceMyAge.com:* Robert Samuels is 29 years, 6 months younger than real age. It’s a fact: “30-somethings have a whole new look.”

*“It’s an optical illusion,” says Karl Ricanek. “They look younger than they are.”*

*So far, no one has been 30 when using FaceMyAge.com.*

*Robert Samuels* says, “I’m happy to be looking younger than my age.”

*His face will show signs of aging in 9 years.*

*Other 30-somethings:*

- *Nick* - 24, 8 months
- *Samantha* - 30, 8 months
- *David* - 29, 6 months
- *John* - 30, 0 months
- *Emily* - 30, 6 months

*Variations in the results depend on age, gender, and skin type.*
A New Solution for Life Insurance

Welcome to **4SIGHT**.
Life insurance made easier.

In **less than 10 minutes**, get the best, most affordable life insurance plan for your needs.

With **4SIGHT**, you’re in Control:

- No invasive medical exams
- No sales pressure and no need to talk to anyone
- You decide which policy and premium is right for you
- Immediate enrollment and coverage

First, we need your **full name, email address** and a **photo**.

Don’t worry, we won’t share your information with any third party and you can always choose not to receive emails from us in the future.

Full Name

Email

We need a recent photo to help us calculate the best price and plan for you based on your estimated lifespan.

We use patented facial analytics to examine your face for signs of longevity. Then we’ll estimate your lifespan and share the results with you in just a few minutes.

Source: https://demo.lapetussolutions.com/light/home
Online Dating
Finding Better Matches with Face

- Tom
  - Male
  - 32 years old
  - 178cm
  - Graduated from Cambridge
  - ...
- Mark
  - Male
  - 32 years old
  - 178cm
  - Graduated from Cambridge
  - ...
Challenges in Online Dating Screening Process

VS.

400 Survey Questions

Facial Appearance-based
Face Preference-based Screening
Face Perception Framework

Ref: Yinghui Zhou, Shasha Lu, and Min Ding. “A Face Anonymity-Perceptibility Paradigm and An Application in Online Dating Industry”
The Matching Result

Percentage of correct predictions

Recommend top one  Recommend top four

Ref: Yinghui Zhou, Shasha Lu, and Min Ding. “A Face Anonymity-Perceitbility Paradigm and An Application in Online Dating Industry”
A New Solution for Online Dating

Face X
Managing Your “First Impression”
Do faces affect how a viewer reacts to an ad in the metrics that advertisers care about?
The new fragrance for men
ESSENZIALE
the one gentleman
The new fragrance for men

ESSENZIALE
the one gentleman
Is the effect large enough (and/or affect the right viewers) to warrant careful selection of faces when constructing print ad?
Maximum Absolute Percentage Improvement for High Rating Participants

## Content Targeting

<table>
<thead>
<tr>
<th>Trait</th>
<th>Segment 1</th>
<th>Segment 2</th>
<th>Segment 3</th>
<th>Segment 4</th>
<th>Segment 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size</td>
<td>40</td>
<td>82</td>
<td>386</td>
<td>344</td>
<td>137</td>
</tr>
<tr>
<td>Demographics&lt;sup&gt;a&lt;/sup&gt;</td>
<td>More female</td>
<td>More female</td>
<td></td>
<td></td>
<td>Older</td>
</tr>
<tr>
<td>Cognitive style&lt;sup&gt;b&lt;/sup&gt;</td>
<td>Prefer parts and details</td>
<td>Less visually driven</td>
<td>Younger</td>
<td>More male</td>
<td>Value authority less</td>
</tr>
<tr>
<td></td>
<td>More visually driven</td>
<td>Less analytical</td>
<td>Less Caucasian</td>
<td>Mainly Caucasian</td>
<td>Value choosing own goals less</td>
</tr>
<tr>
<td>Value system&lt;sup&gt;c&lt;/sup&gt;</td>
<td>Value authority less</td>
<td>Value choosing own goals more</td>
<td>More visually driven</td>
<td>Less visually driven</td>
<td>Value authority more</td>
</tr>
</tbody>
</table>

What can You do with face analytics?
Customer Insights from Video Analytics
Fashion Retailing
Understanding Customer Preference from Video
Customer Feedback

“There are too many clothes displayed in a store. I don’t have the time or effort to carefully check every piece of clothing. The system saves me a lot of time and effort by finding what I like in several rounds.”

“I don’t trust a salesperson’s recommendations since their recommendations are often very subjective, and they make recommendations based on what they would like to sell, rather than how I look.”

“The system is like magic! It made recommendations on some clothes that I would never pick myself, but when I follow the recommendations and try them on, they look amazingly good on me.”

▪ Field Test Result: intention to try on (95%), purchase (50%)
▪ Shopping Experience: similar (44%), very similar (20%)
▪ Easy-to-use: easy/very easy (56%), difficult (16%)
▪ Willing to use in retailing store: 89%
Where does visual data come from?
When to use?

Product Design

Customer Analysis

Content Marketing
The Future Battlefield for Marketers

Opportunity for actionable insights
The Eigenface Decomposition