

Practicing Statistics and Data Science at P&G

Virtual Career Fair for Statisticians in Consumer Products or Biopharm Industries
NISS Virtual Event
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Procter & Gamble Facts

- Established in 1837 (Initially a Soap and Candle Company, Cincinnati, Ohio)



Procter & Gamble Facts

- 5+ Billion Consumers
- 130+ Countries
- ~95,000 Employees Worldwide



Procter & Gamble Business Units and Brands

Baby	Feminine Care	Family	Fabric	Home	Hair	Skin & Personal Care	Grooming	Oral	Personal Health Care
  	 	 	   	   	  	  	  	 	 

Corporate Functions



My role as Global Statistics Discipline Leader...

Statistics & Data Science Organization at P&G

~ 54 Statisticians (Ph.D., MS and BS)

~ 55 Data Scientist (Ph.D., MS and BS)



DATA &
MODELING
SCIENCES
Unlocking Innovation

R&D – Dual Career Track

Technical

Management

Entry



Statistics & Data Science at P&G

US

- Cincinnati
- Boston



Statistics & Data Science at P&G

Europe

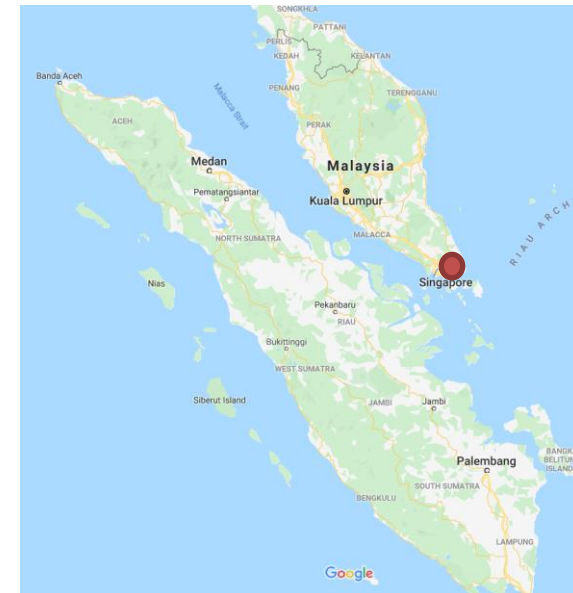
- UK
- Germany
- Belgium



Statistics & Data Science at P&G

Asia

- Beijing
- Singapore



Application Areas

Consumer Research



Product, Package and Process Development



Clinical Research



Application Areas

Claims



Biotech



Product Safety



Design and Analysis of Experiments for Product, Package and Process Development

Develop a new laundry formulation
with improved consumer benefit



Develop a new bottle design



Develop a new optimal process



Packaging Development via Computer Simulation

Business Problem: Reduce the cost for expensive creation of prototypes and testing for new bottle development

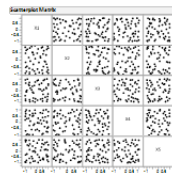
Statistical Method/Tool: Design & Analysis of Computer Experiments



Design:

Select input values to feed the simulator

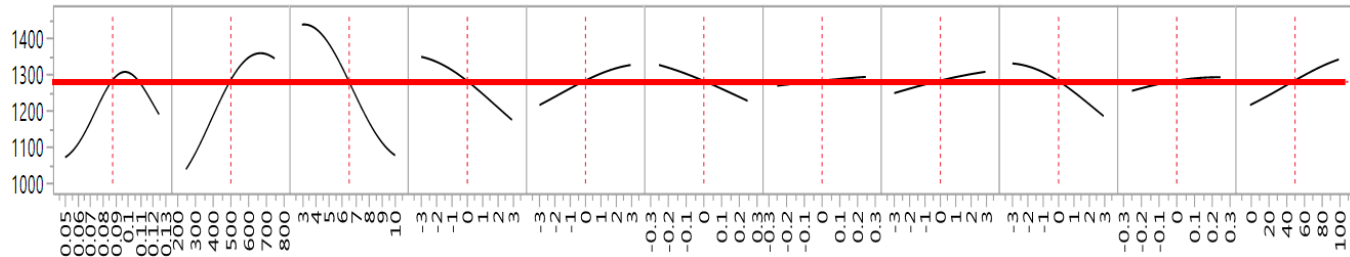
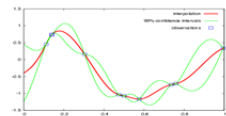
Space-filling Design



Modeling:

Fit statistical surrogate model

Gaussian Process Model



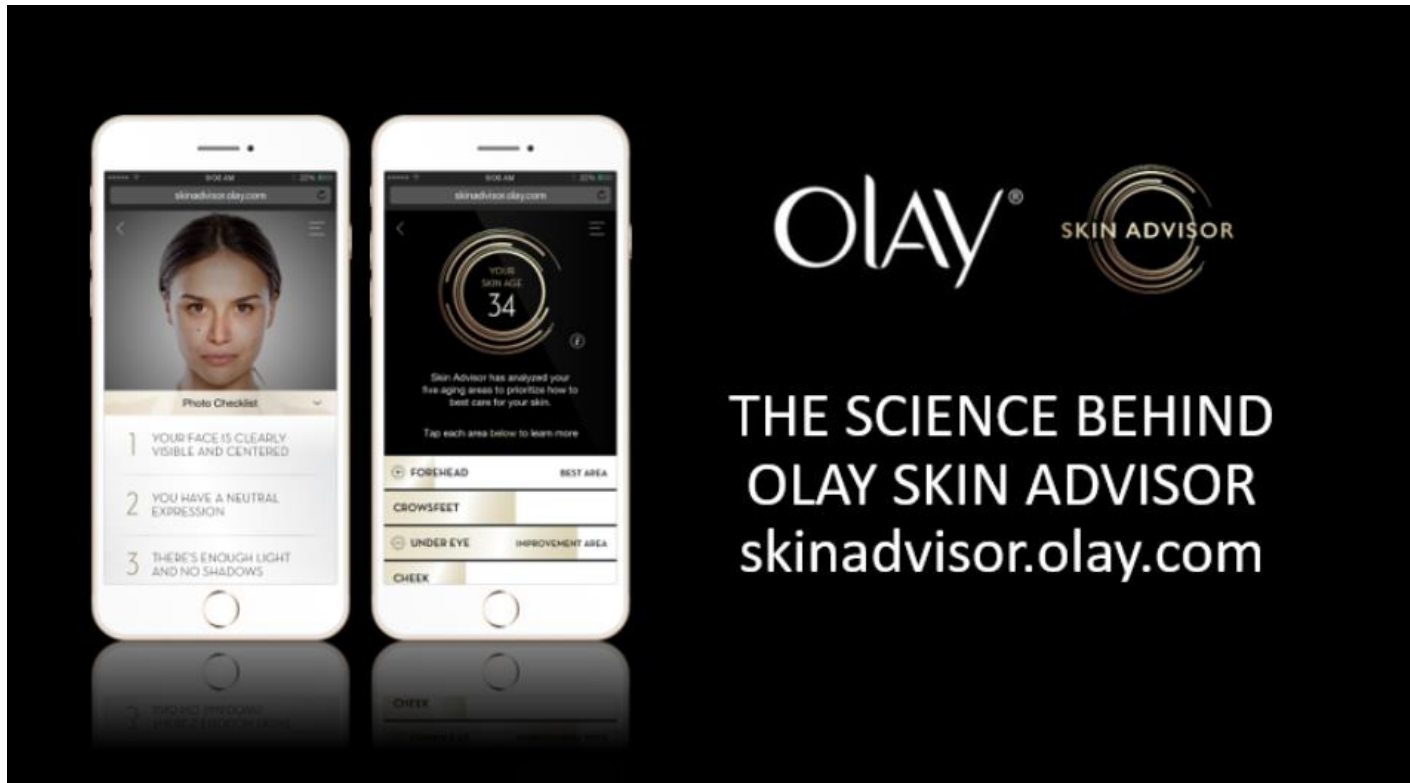
Text Analytics

➤ Gain Consumer Insight on Unstructured Text Data

- *Survey of a Consumer Study*
- *Product Review*
- *Consumer Complaints*



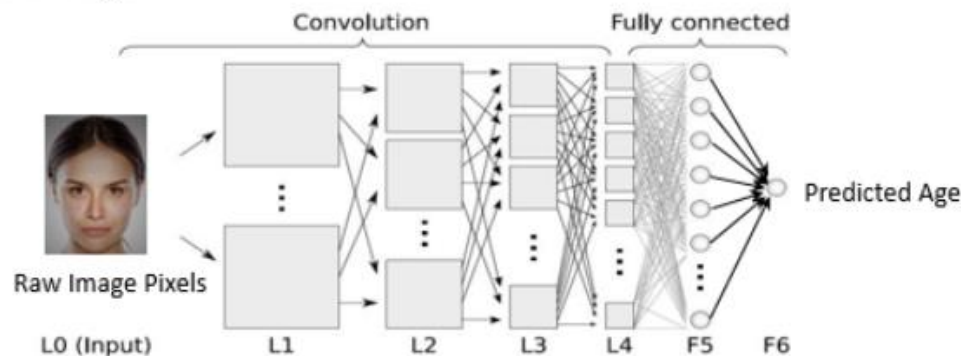
Consumer Education and Product Recommendation Olay Skin Advisor



Deep Learning

Deep Neural Network application

- The skin advisor uses convolutional neural networks trained using NVIDIA graphics processors to perform trillions of calculations per second. The model was trained on 50,000 images with chronological age data tags.
- When an image of a user is received, the model is used to determine the visible skin age based on the pixels in the image, further a two-dimensional heat map is generated that identifies a region of the image that contributes to the visible skin age.



Technical Skills

➤ Design and Analysis of Experiments

- Physical Experiments
- Computer Experiments
- Discrete Choice

➤ Explanatory and Predictive Modeling

- Linear Models, Generalized Linear Models and Non-linear Models
- Response Surface Methodology
- Statistical/Machine Learning, Deep Learning
- Multivariate methods, Partial Least Squares (PLS)
- Reliability Modeling

➤ Data Visualization

➤ Other Areas

- Bayesian Methods
- Multivariate Methods
- Text Analytics
- Statistical Process Control
- Evaluating Measurement Systems (Gauge R&R)

➤ Programming – R, SAS, Python, etc.



Non-Technical Skills

- **Good Communicator**

- Verbal
- Written
- Develop Good Presentations

- **Good Collaborator (“Team Player”)**

- **Good Problem-Solving Skills**

- **“Innovative Spirit” and “Entrepreneurial Spirit”**

- **Effective Problem Definition – Help Project Teams Get Clarity on Defining Their Problem**

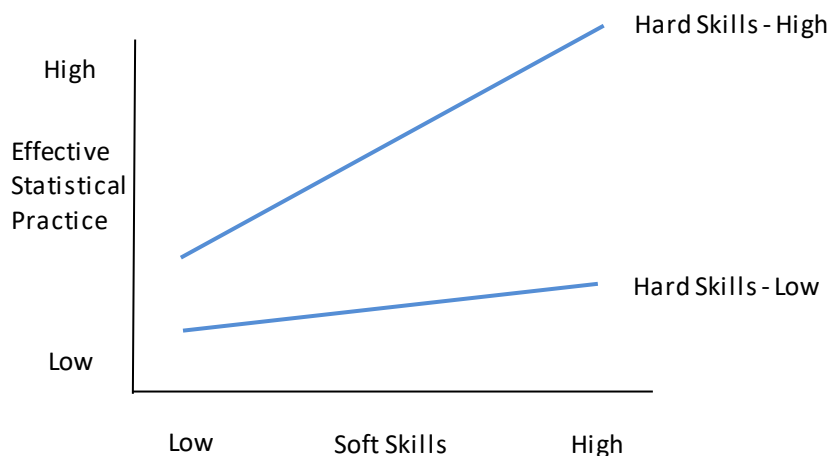


Final Thoughts...

Leadership Thoughts: Statistician in Industry – Technical Career Track

- Lead through problem solving and innovation. Solve large, unstructured, impactful problems - Statistical Engineering. *Influencing and Collaboration are KEY*
- Lead/drive Industry and Academic connections
- Lead the Leaders – lean-in on strategic discussions and management decisions. *Contributor* to management decisions - organizational design, ratings, promotions, etc
- Lead through Coaching and Mentoring

Hard and Soft Skills Interaction Plot



1. Hard Skills
Theory, Technical Mastery, Computing
Learn how to Learn – Keep Learning!
Identify NEW Problems and Collaborate with Academia
2. Soft Skills
 - **Communication**, Influencing, Collaboration
 - Statistical Engineering
 - Integrity, responsibility, honesty, ...*"Do the right thing!"*

Open Positions and Additional Information

For all full time and intern positions, please go to pgcareers.com

Full time positions (R&D)

- a. [Statistician / Senior Statistician, Statistics & Consumer Research Analytics, Beauty Care at Procter and Gamble \(pgcareers.com\)](https://pgcareers.com) *Singapore or Beijing*
- b. [Data & Modeling Sciences - Director at Procter and Gamble \(pgcareers.com\)](https://pgcareers.com)
- c. [Senior Bayesian Statistician at Procter and Gamble \(pgcareers.com\)](https://pgcareers.com)
- d. [Data Scientist at Procter & Gamble \(pgcareers.com\)](https://pgcareers.com)

Full time positions (IT)

- a. [Data Scientist Masters \(Evergreen\)](https://pgcareers.com)
- b. [Data Scientist PhD \(Evergreen\)](https://pgcareers.com)

Intern positions (IT) - Summer 2022

- a. [Data Scientist Masters Internship \(Evergreen\)](https://pgcareers.com)
- b. [Data Scientist PhD Internship \(Evergreen\)](https://pgcareers.com)



For more information about P&G, please go to us.pg.com