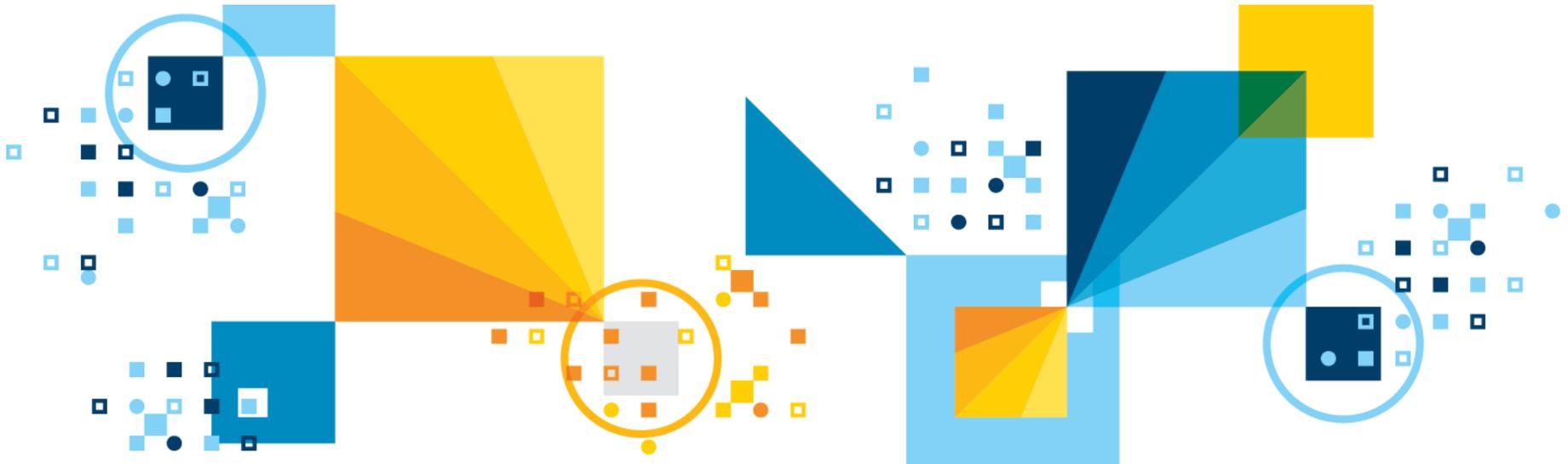


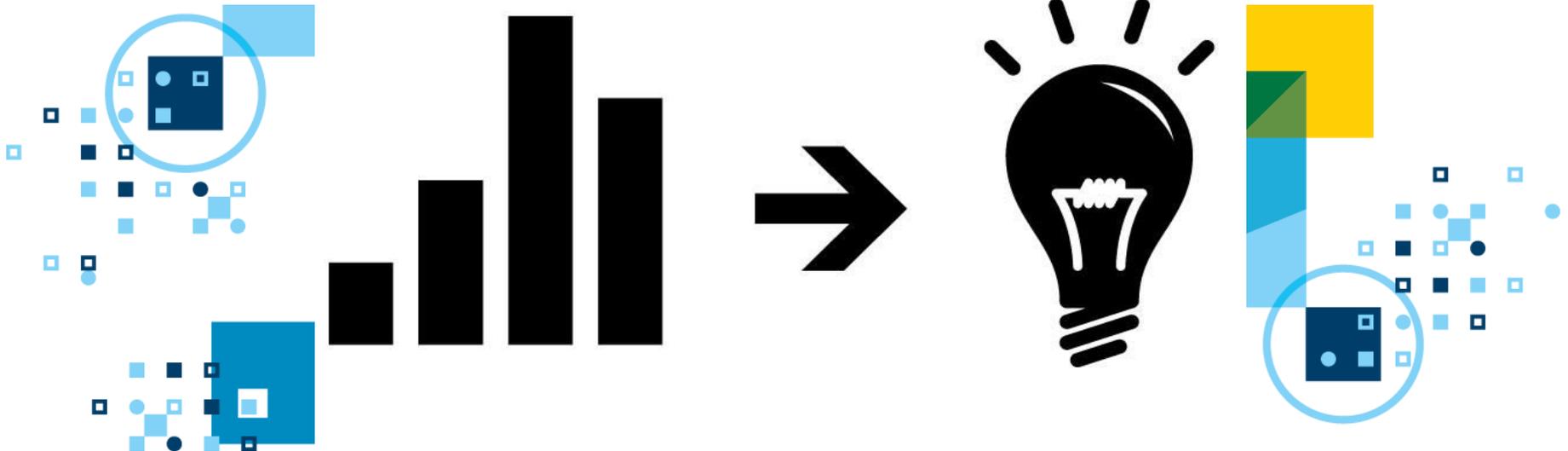
Data Science Use Cases

Dr. Alex Liu, Principal Data Scientist
August 2015



Data Science Definition

- **Data Science** is an interdisciplinary field about processes and systems to extract knowledge or insights from large volumes of **data** in various forms either structured or unstructured, which is a continuation of some of the data analysis fields such as **data** mining and predictive analytics, as well as knowledge discovery and **data** mining (KDD).
- **Data Science** is about turning data into insights.



Data Science Example



Google Flu Trend Analytics

Detecting outbreaks
two weeks ahead
of CDC

Estimating which cities are
most at risk.

Data Science Example

elections2012

[Live results](#)[President](#)[Senate](#)[House](#)[Governor](#)[Choose your](#)

Numbers nerd Nate Silver's forecasts prove all right on election night

FiveThirtyEight blogger predicted the outcome in all 50 states, assuming Barack Obama's Florida victory is confirmed

Luke Harding

guardian.co.uk, Wednesday 7 November 2012 10.45 EST



Turning Big Data into Low Risk

- A financial service company has been using FICO and other industry standard risk scores to underwrite its loans, but the default rate is only a little better than the industry average
- ANALYTICS – combined thousands of variables into many meta variables with latent variable modeling, then built a few predictive models with meta variables, ensemble all the models for final scoring
- RESULTS – cut default rate by half while maintaining the same approval rate.

Big Data to Ad Revenue Increase

- An online product searching corporation did not have a good predictive model of its Click Through Rate on product offers that made its web page ranking not ideal and produced low ad revenue
- Data Science – used time series modeling with Bayesian smoothing and built models parallelly for more than two thousands of categories
- RESULTS – more accurate prediction of CTR led to better web page ranking led to more ad revenue

Advanced Propensity Model to Increase Marketing Effectiveness

- A giant distributing company's marketing division used a propensity model performed poorly, as leads selected by this old model do not increase response rate much
- Data Science: Merged with more data sources and improved modeling processes PLUS used advanced analytics to deal with missing values
- RESULTS: Clear marketing effectiveness led to increase marketing managers' confidence in analytics and to optimal ROI

Advanced Causal Modeling to Optimize Marketing Spending

- A giant retailing corporation received conflicting proposals on marketing spending to increase sales
- Data Science – with survey data, advanced causal model of consumer purchase was built with the total effects of various factors on final sales calculated for optimization
- RESULTS – obtained an optimal combination of marketing programs with a big sales increase

More data science examples ...

Capabilities



Know Everything about your Customer

Analyze all sources of data to know your customers as individuals



Innovate New Products at Speed and Scale

Capture all sources of feedback and analyze vast data to drive innovation



Instant Awareness of Fraud and Risk

Analyze all available data, detect fraud and manage risk in real-time



Exploit Instrumented Assets

Predict and prevent maintenance, develop new products & services

Outcomes

Creates customized offers up to 125x faster with better results

Reduced processing time in half

Identified fraud which previously went undetected

Loads hurricane data in seconds and performs risk analysis in near real-time for greater reliability