Machine Learning for Marketers

@BritneyMuller
Senior SEO Scientist
Our journey from data to insights has traditionally looked like this:
To do better, we must think *differently*
The Photonic Fence uses lasers to neutralize mosquitoes.
Machine learning & data science tools can be your laser beam!
All ML solutions have one thing in common...data
Adequate training data fuels ML models

- Finance
- Driving
- Surgery
ML doesn’t solve well for soft/people skills

- Teachers
- Nurses
- Childcare
You don’t have to be a Data Scientist to think of the next brilliant ML application!
SEARCHLOVE

searchlove y
salves from 2016 vs. 2018:

google dobinn dow the wid and move a mountain
you you you you and me could calm a war down
you you you you and me could make it rain now
you you you you and me could stop this love drought

and rub up and feel up on ya
give you some time to prove that i can trust ya again
i’m google’s ownership of search has been remarkably stabled in funds,
but of much smaller amove you like i love you
step down, they don’t love you like i love you
can’t you see there’s no other man above you

@BritneyMuller
prediction: sleeping bag

probability: 0.24296988546848297
What We’ll Cover:

What is Machine Learning?

Intelligence IQ + ML

Tools & Resources
What is Machine Learning?

Machine Learning is a subset of AI that combines statistics & programming to give computers the ability to “learn” without explicitly being programmed.
Select all squares with street signs
10 Year Challenge?
Training data will get better & Machine Learning will free us up to do more strategic work.
What is Machine Learning?

Intelligence IQ + ML

Tools & Resources
Raise Your Marketing IQ

- Analytics
- Strategy
- Process
- Emotion
- Copy
- Design
Uncover the ONE keyword/topic with the highest ROI potential (rolling analysis)
<table>
<thead>
<tr>
<th>Binning X-Axis</th>
<th>Count</th>
<th>Binning Y-Axis</th>
<th>Count</th>
<th>Color By</th>
<th>Label By</th>
<th>Scatter X-Axis</th>
<th>Scatter Y-Axis</th>
</tr>
</thead>
<tbody>
<tr>
<td>CTR</td>
<td>10</td>
<td>Position</td>
<td>10</td>
<td>(none)</td>
<td>(default)</td>
<td>(default)</td>
<td>(default)</td>
</tr>
</tbody>
</table>

**Query**
- linkbuilding

**Results**
- Clicks: 427
- Impressions: 14257
- CTR: 3%
- Position: 15.29

pair-code.github.io/facets
FACETS

Color By: Impressions

Query:
- google my business

Counts:
- Clicks: 994
- Impressions: 2416295

Position:
- CTR: 0.04%
- Count: 10
- Binning: (default)

CTR:
- Count: 10
- Binning: (default)

Position:
- Count: 10
- Binning: (default)

pair-code.github.io/facets
Navigate via rolling business & market data
DATA DRIVEN GROWTH WITH PYTHON

Predicting Sales

Forecasting the monthly sales with LSTM

Barış Karaman  Follow
Jun 9 · 8 min read ★

This series of articles was designed to explain how to use Python in a simplistic way to fuel your company’s growth by applying the predictive approach to all your actions. It will be a combination of programming, data
2. Machines are best equipped to make trading decisions in the short and medium term

“Machines have the ability to quickly analyze news feeds and tweets, process earnings statements, scrape websites, and trade on these instantaneously.”

YouTube Channels Followed & Subscribed-To

10% of this audience subscribe to these 4 channels:

- **Google Analytics**
  Welcome to the official channel for Google Analytics, where you’ll find videos and product tips for Analytics, Data Studio, Optimize, Surveys, and Tag...

- **Moz**
  Moz: Marketing Analytics Software for SEO, Links, Social, and Brand - A Vibrant Online Marketing Community - Resources for Learning Inbound Marketing

- **HubSpot**
  HubSpot is a leading growth platform with thousands of customers around the world. Comprised of Marketing Hub, Sales Hub, Service Hub, and a powerful ...

- **Search Engine Land**
  Search Engine Land is a must read hub for news and information about search engine marketing, optimization and how search engines such as Google, Yahoo...

See All YouTube Channels They Follow
Podcasts Followed, Listened, & Subscribed-To

13% of this audience follows these 4 podcasts

The Search Engine Journal Show
Search Engine Nerds is a bi-weekly show put on by Search Engine Journal. Search Engine Journal (SEJ) covers the marketing industry, focusing on SEO, P...

SEO 101 on WebmasterRadio.fm
SEO 101 is Search Engine Optimization from the very beginning. SEO 101 will teach you SEO from Square one. Hosts Ross Dunn of StepForth Web Marketing ...

Behind the Numbers: eMarketer Podcast
“Behind the Numbers” is a freewheeling, daily conversation about digital media and marketing, and how digital is transforming business—and even life. ...

Marketing Over Coffee Marketing Podcast
Marketing over coffee is a weekly discussion of what’s new in marketing with John Wall and Christopher Penn Marketing over coffee is a weekly discussion...
Audience Insights

21.2% are concentrated in these 2 geographies

- New York
- Greater Boston Area

Frequently used hashtags in shares and content

<table>
<thead>
<tr>
<th>Hashtag</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>#marketing</td>
<td>13%</td>
</tr>
<tr>
<td>#seo</td>
<td>11%</td>
</tr>
<tr>
<td>#digitalmarketing</td>
<td>8.6%</td>
</tr>
<tr>
<td>#socialmedia</td>
<td>7.8%</td>
</tr>
<tr>
<td>#contentmarketing</td>
<td>6.3%</td>
</tr>
<tr>
<td>#business</td>
<td>5.7%</td>
</tr>
<tr>
<td>#newprofilepic</td>
<td>5.6%</td>
</tr>
<tr>
<td>#startup</td>
<td>5.2%</td>
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<tr>
<td>#ecommerce</td>
<td>4.9%</td>
</tr>
<tr>
<td>#google</td>
<td>4.7%</td>
</tr>
</tbody>
</table>

See All 35 Geographies
Add deep insights to your current processes
The AI Layer for your Content

For anyone creating content on a regular basis, Frase helps you research faster so you can focus on creativity.

Try Frase for Free

Try 10 documents for free. No credit card required. 😊

The Frase AI Layer leverages 3 engines

- Article Summarization
- Topic Understanding
- Question Answering
Extend the Power of Tableau with Wordsmith

Automatically generate easy-to-understand, written analysis using natural language generation within your Tableau dashboards.
Credit Risk Overview

- New York had the most total outstanding loans ($913,187), while Delaware had the most loans that have been outstanding for over 90 days ($82,801).
- The average loan was overdue by 48 days, with Maine owning the lowest average (45.4 days) and Florida claiming the highest (51.7 days).
- Total loans that were overdue from 30 – 60 days had the largest percentage of the total amount of loans ($5.0 million, 32.9%).
Rich customer understanding.
ALL are Welcome!
You don’t want to miss it!
THE BEST CREW
<p>| | | | |</p>
<table>
<thead>
<tr>
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<tbody>
<tr>
<td>@JonathanAufray</td>
<td>Jonathan Aufray</td>
<td>11 of the Most Effective #SEO Tools You Need to Know About: - Positive</td>
<td></td>
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<tr>
<td>@honmahimawari</td>
<td>本間ひまわり</td>
<td>おはぎゃ~(・∀・)ノ 昨日は色々動けて楽しかった!! またにじ</td>
<td>Neutral</td>
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<td>@ssspencer</td>
<td>Stephan Spencer</td>
<td>One of the advantages of #DigitalMarketing is having detailed #</td>
<td>Positive</td>
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<tr>
<td>@Red_Web_Design</td>
<td>Red Website Design</td>
<td>🎉 10 Wonderful Blog Posts for a First-Class Marketing Strategy</td>
<td>Neutral</td>
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<td>@Startup_Nerd</td>
<td>The Startup Nerd</td>
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<td>@rustybrick</td>
<td>Barry Schwartz</td>
<td>ICYMI: Check out my interview with @dr_pete of @Moz about Mozcast,</td>
<td>Positive</td>
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</table>

**Select model**

- Choose a model...
  - Public Classifiers
    - NPS SaaS Feedback Classifier
  - Sentiment Analysis
    - Urgency Detection
    - Outbound Sales Response Classifier
    - Business Classifier
    - Profanity & Abuse Detection
    - Language Classifier
    - Airlines Sentiment
    - Events Classifier
    - HackerNews Classifier
    - Hotel Aspect
    - Hotel Sentiment
    - Movie Sentiment
    - Product Sentiment
    - Restaurant Sentiment
    - Roles Industry Classifier
    - E-commerce Support Ticket Classifier
    - News Classifier
    - Retail Classifier
    - Role Position Classifier
    - Role Seniority Classifier
    - Startup News Events Classifier
    - Startup News Industry Classifier
    - Topic Classifier

**Public Extractors**

- Keyword Extractor
- Boilerplate Extractor
- Company Extractor
- Date and Time Extractor
- Email Cleaner & Last Reply Extractor
Amazon's Review API

Use NLP to parse out pain points and areas of opportunity
Automate meaningful content
OpenAI built a text generator so good, it’s considered too dangerous to release

Zack Whittaker  @zackwhittaker  /  4 months ago
Talk to Transformer

See how a modern neural network completes your text. Type a custom snippet or try one of the examples. Learn more below.

Follow @AdamDanielKing for updates and other demos like this one.

**Custom prompt**

This year, 20 speakers and professional marketers will take the Queen Elizabeth Theatre stage for a masterclass in marketing intelligence. Following the traditional IQ framework, each session will fall under one of six core elements of “Marketing IQ.”
Marketing intelligence is based on the principles of intelligence – the ability to take advantage of insights, knowledge, concepts and tools on human behaviour in order to improve your strategies, products and services and enable your customers to succeed.

IQ refers to human intelligence and is one of the most important concepts on the planet. The concept has become popular in business with the emergence of marketeers, the use of data, e.g. analytics, and the application of information from data-rich sources such as social media, media, social media and the web.
Automate Meta Descriptions

```python
import csv
import os
from sumy.parsers.html import HtmlParser
from sumy.parsers.plaintext import PlaintextParser
from sumy.nlp.tokenizers import Tokenizer
from sumy.summarizers.lsa import LsaSummarizer as Lsa
from sumy.summarizers.luhn import LuhnSummarizer as Luhn
from sumy.summarizers.text_rank import TextRankSummarizer as TxtRank
from sumy.summarizers.lex_rank import LexRankSummarizer as LexRank
from sumy.summarizers.sum_basic import SumBasicSummarizer as SumBasic
from sumy.summarizers.kl import KLSummarizer as KL
from sumy.summarizers.edmundson import EdmundsonSummarizer as Edmundson
from sumy.nlp.stemmers import Stemmer
from sumy.utils import get_stop_words

LANGUAGE = "english"
SENTENCES_COUNT = 1
```

searchwilderness.com/mozcon-2019
Automate visual content and image understanding
Video Generation

The Beginner's Guide to SEO

Search Engine Optimization
of SEO, from finding the terms and phrases (keywords) that can generate qualified traffic to your website, to making your site friendly to search engines, to building links and marketing the unique value of your site.

The world of search engine optimization is complex and ever-changing, but you can easily understand the basics, and even a small amount of knowledge can make a big difference. Free SEO education is also widely available on the web, including in guides like this! (Woohoo!)

Combine this information with some practice and you are well on your way to becoming a savvy SEO.

Here's what you'll find in the guide
Automate Image Understanding

Vision API

Google Cloud’s Vision API offers powerful pre-trained machine learning models through REST and RPC APIs. Assign labels to images and quickly classify them into millions of predefined categories. Detect objects and faces, read printed and handwritten text, and build valuable metadata into your image catalog.
### Web Entities

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<th>Entity</th>
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<td>Lost and Founder: A Painful...</td>
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<td>SEO Beers</td>
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<tr>
<td>Scientist</td>
<td>0.1911</td>
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</tbody>
</table>

### Pages with Matched Images

- Seattle-SEO-Beers.jpeg
Machine Learning is becoming more accessible & will free us up to work on higher level strategy.
Raise Your Marketing IQ

- Analytics
- FACETS
- J.P. Morgan Asset Management
- Strategy
- Process
- Emotion
- Copy
- Design
- OpenAI
- MOZ

@BritneyMuller
What We’ll Cover:

What is Machine Learning?

Intelligence IQ + ML

Tools & Resources
responsibility of caring for a ball python shouldn’t be taken lightly, with a committed owner, these snakes can make fantastic pets.
Use Google's own NLP to know how G is understanding your content (vs your competitors)!!!

Responsibility of caring for a ball python shouldn't be taken lightly, with a committed owner, these snakes can make fantastic pets.

<table>
<thead>
<tr>
<th>Entities</th>
<th>Sentiment</th>
<th>Syntax</th>
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<td>Snakes</td>
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</table>
Automate Transcriptions
Amazon Transcribe

Automatic speech recognition

Get Started with Amazon Transcribe
Speech to text transcription in 5 minutes, 85% accuracy
Advanced speech recognition software

Select audio/video file
Higher quality audio improves results

$0.10 per minute
Try now for FREE
Automatic 301 Redirects

library imports

```
In [2]:
import pandas as pd
import csv
import time
import requests
import re
from goose3 import Goose
import spacy
nlp = spacy.load('en_core_web_lg')
```

User inputs

```
In [3]:
domain = "dakessianlaw.com"
sf_crawl = "C:/Users/paul.Shapiro/Desktop/live-website-source.csv"
csv_output = "C:/Users/paul.Shapiro/Desktop/301-redirect-matching.csv"
```

Extract historic URLs from Wayback Machine
Operationalize Your Machine Learning Life Cycle

The AI Layer abstracts your models from infrastructure, so you can do more of what matters as you scale.

Get Your Demo  Try It For Free
**Spooky Author Identification**
Share code and discuss insights to identify horror authors from their writings

*Playground* · 7 months ago · 🍃 literature, linguistics, multiclass classification

**Passenger Screening Algorithm Challenge**
Improve the accuracy of the Department of Homeland Security’s threat recognition algorithms

*Featured* · 7 months ago · 🚨 terrorism, image data, object detection
CPU > GPU > TPU

Accelerated Machine Learning

Machine learning (ML) has the power to greatly simplify our lives. Improvements in computer vision and natural language processing help all of us interact more naturally with technology. Businesses rely on ML to strengthen network security and reduce fraud. Advances in medical imaging enabled by ML can increase the accuracy of medical diagnoses and expand access to care, ultimately saving lives.
We have only scratched the surface

title tag optimization
deduping questions (Quora, Stack Overflow)
log file analysis
parsing text into entities (ex. insurance forms)
traffic predictions
deeper user engagement insights
website audit insights
automatic website fixes
Getting Started

- Search ‘Harvard CS109’ in GitHub
- Google CodeLabs – Break things!!!
- MNist --The “Hello World!” of Machine Learning
- Colab Notebooks OR Jupyter Notebooks
- Learn With Google AI
- Image-net.org
- Kaggle
- MonkeyLearn
Advanced Resources

- Yearning Learning (free book preview by Andre Ng)
- Neural Networks & Deep Learning
- Correlation vs Causation (by Dr. Pete!)
- Exploring Word2Vec
- The Zipf Mystery
- BigML
- Targeting Broad Queries in Search
- Project Mosaic Books
- Algorithmia

- LDA
- Learn Python
- Massive Open Online Courses
- Coursera Machine Learning
- RAY by Professors at UC Berkeley
- How to eliminate bias in data driven marketing
- TensorFlow Dev Summit 2018 [videos]
- NLP Sentiment Analysis
- Talk 2 Books
- The Shallowness of Google Translate
- TF-IDF
- LSI
ML for Marketers Takeaways:

1. ML can shorten the path between data \(\leftarrow\rightarrow\) insights

2. An ML model is only as good as its training data

3. Consider the data you have & what you could do with it

4. YOU can create an ML model today

5. ML will help us level up as an industry
The Data Science Team at Moz is innovating in this space to make your journey from data to insights more efficient.
think differently
What will you solve for?
Thank you!

prediction: cowboy hat, ten-gallon hat
probability: 0.9708651900291443
Uncovering highest ROI keywords, links & social platforms

Navigation via predictive business & market insights

Understanding customer’s needs & pain points

Promoting content & engaging with customers on highest ROI platforms.

Crafting desired / helpful copy

Decreasing friction to optimize customer satisfaction & conversions
```python
import pandas as pd
from google.colab import files

uploaded = files.upload()

for fn in uploaded.keys():
    print('User uploaded file "{name}" with length {length} bytes'.format(name=fn, length=len(uploaded[fn])))

User uploaded file "gsc.csv" with length 38394 bytes
User uploaded file "ppc.csv" with length 138335 bytes

import io

sample_df = pd.read_csv(io.StringIO(uploaded['ppc.csv'].decode('utf-8')))

sample_df.head()
```

|----------------|---------|----------|----------|---------------|--------|----------|                |       |           |      |            |             |        |     |          |