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What's for Dinner?

Using Predictive UX to Help Users Decide

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About Us

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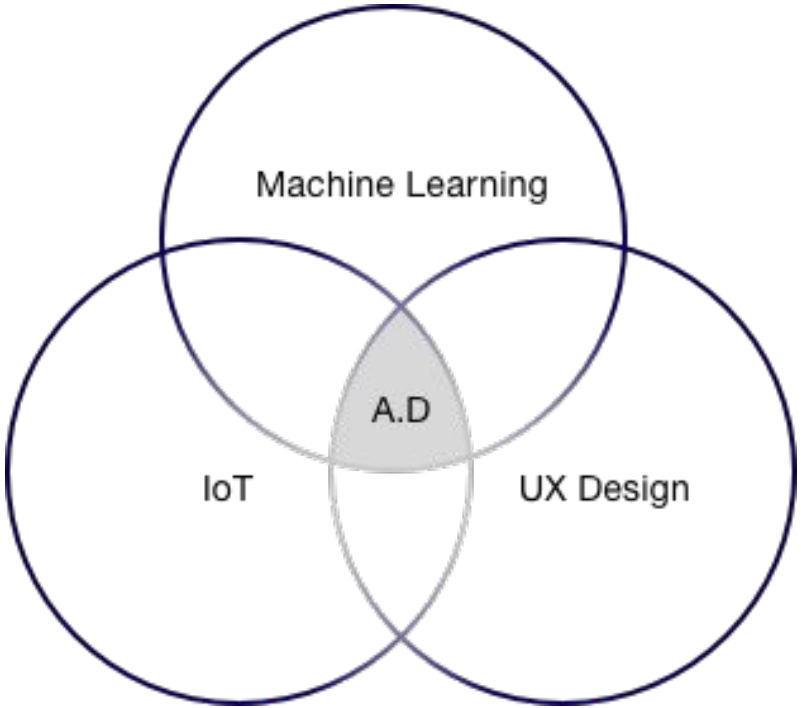
What is Predictive UX?

Machine Learning

“... A design pattern that moves around learning, predicting and anticipating.”

— Joël van Bodegraven



What is Predictive UX?

“Personalization is done by the system being used. Developers set up the system to identify users and deliver … the content, experience, or functionality that matches their role.”

— Amy Schade, Nielsen Norman Group

What is Predictive UX?

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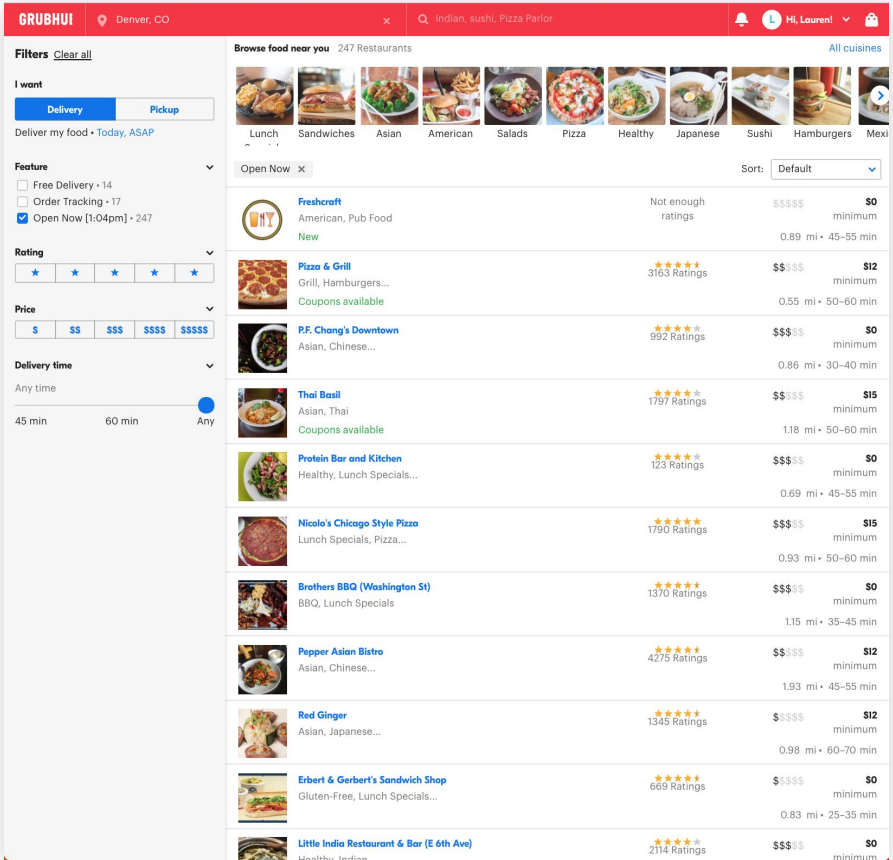
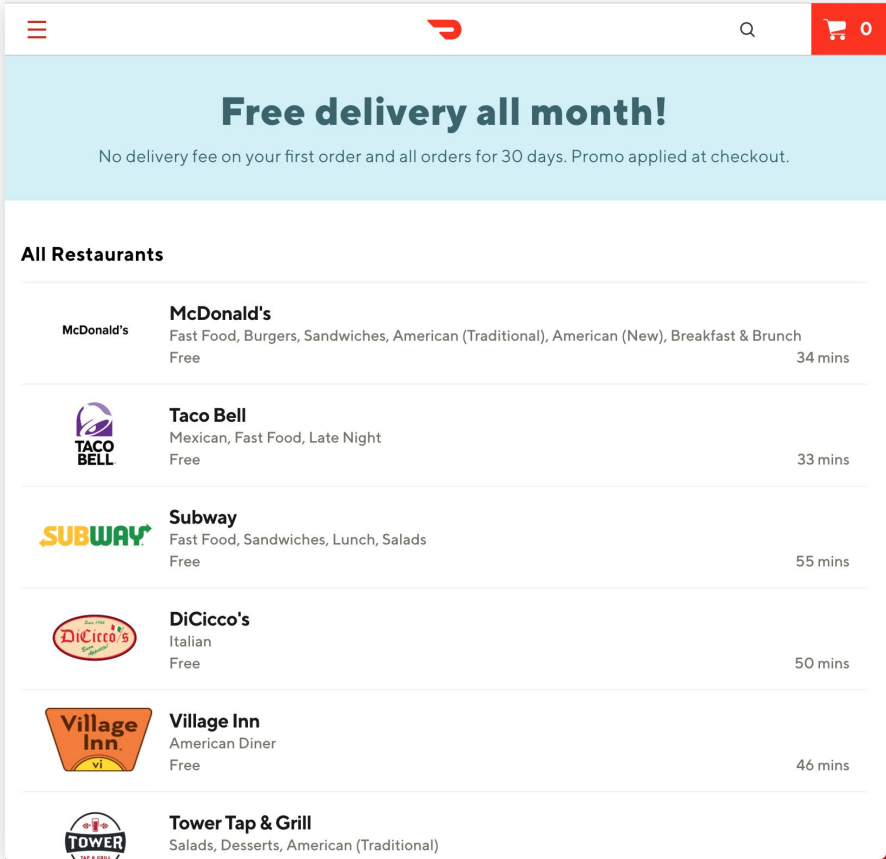




Machine Learning

Machine Learning Powers the End User Experience

Machine learning is the science of getting computers to do things (and learn and improve) without being explicitly programmed.

1

Define your problem in machine learning terms

2

Collect training data in a suitable format

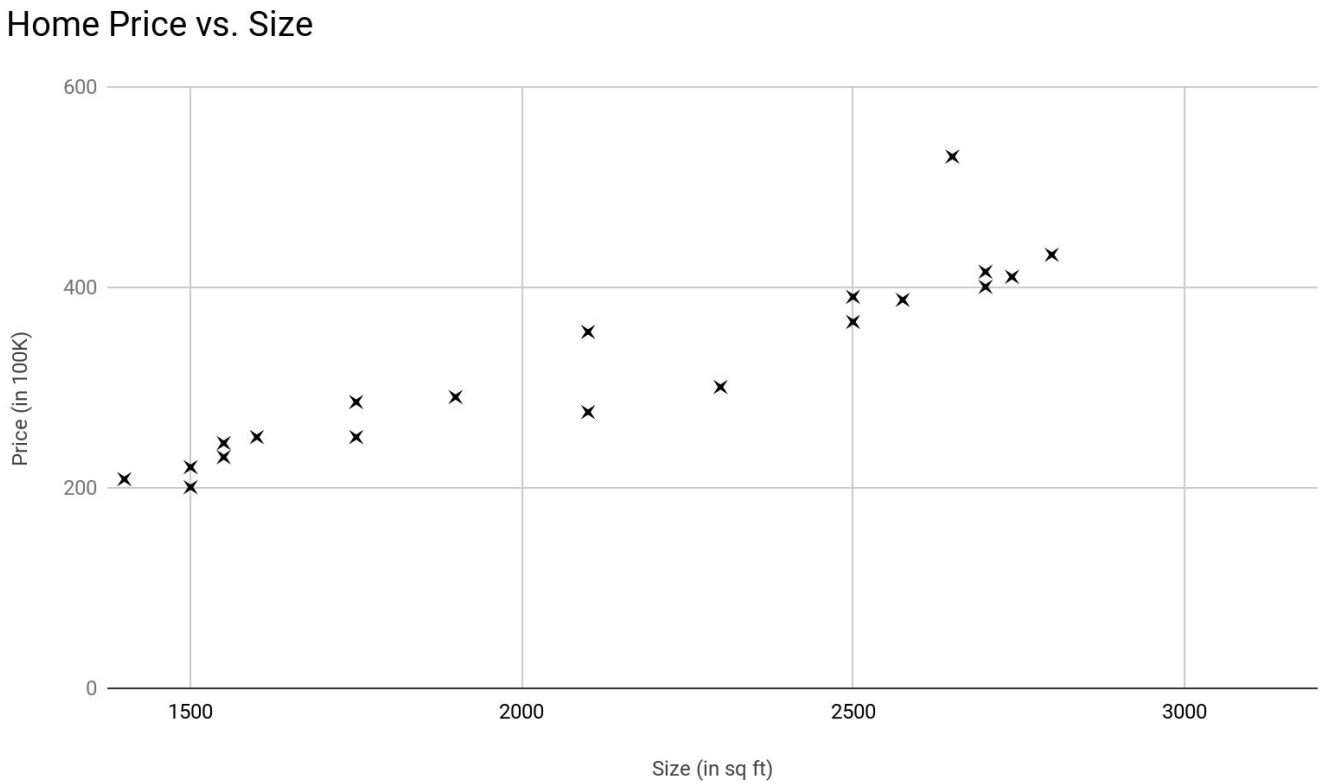
3

Build a model (or a set of models)

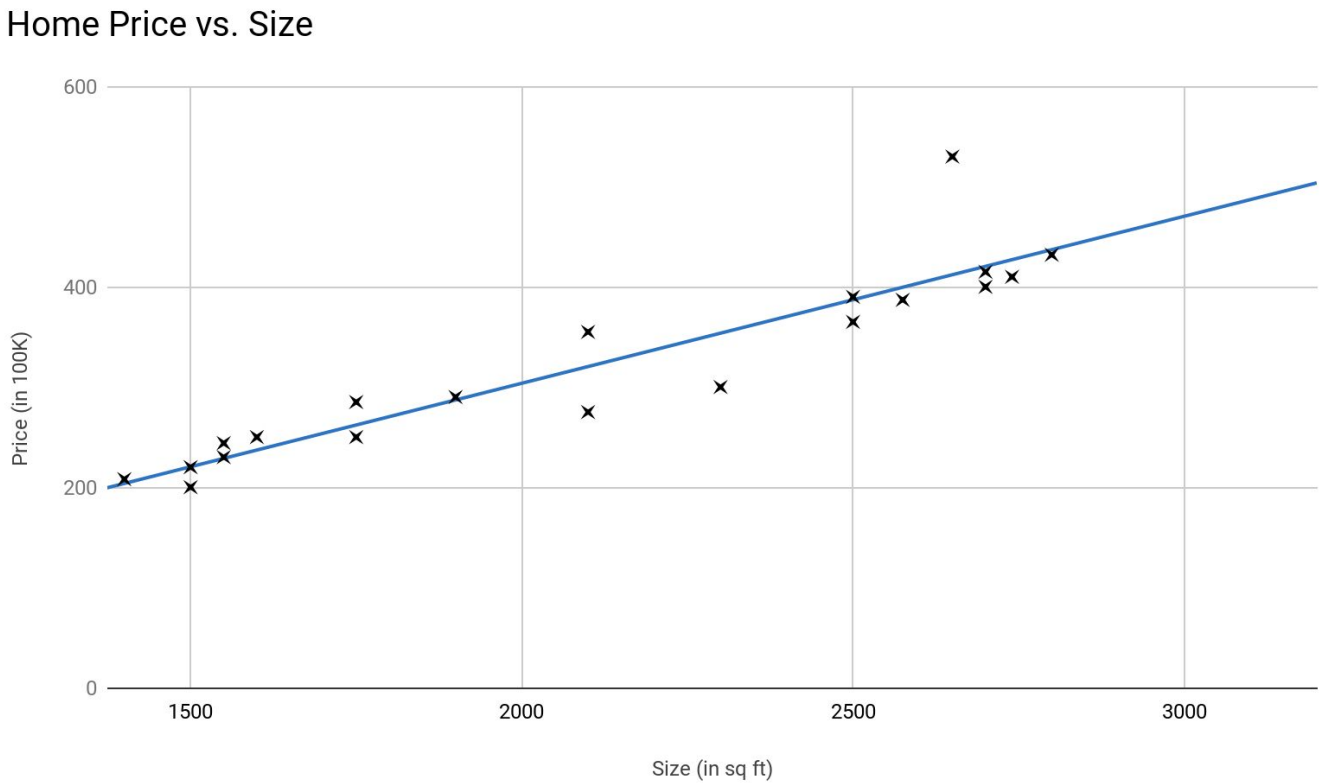
Example:

Predicting the price of a house, given its square footage.

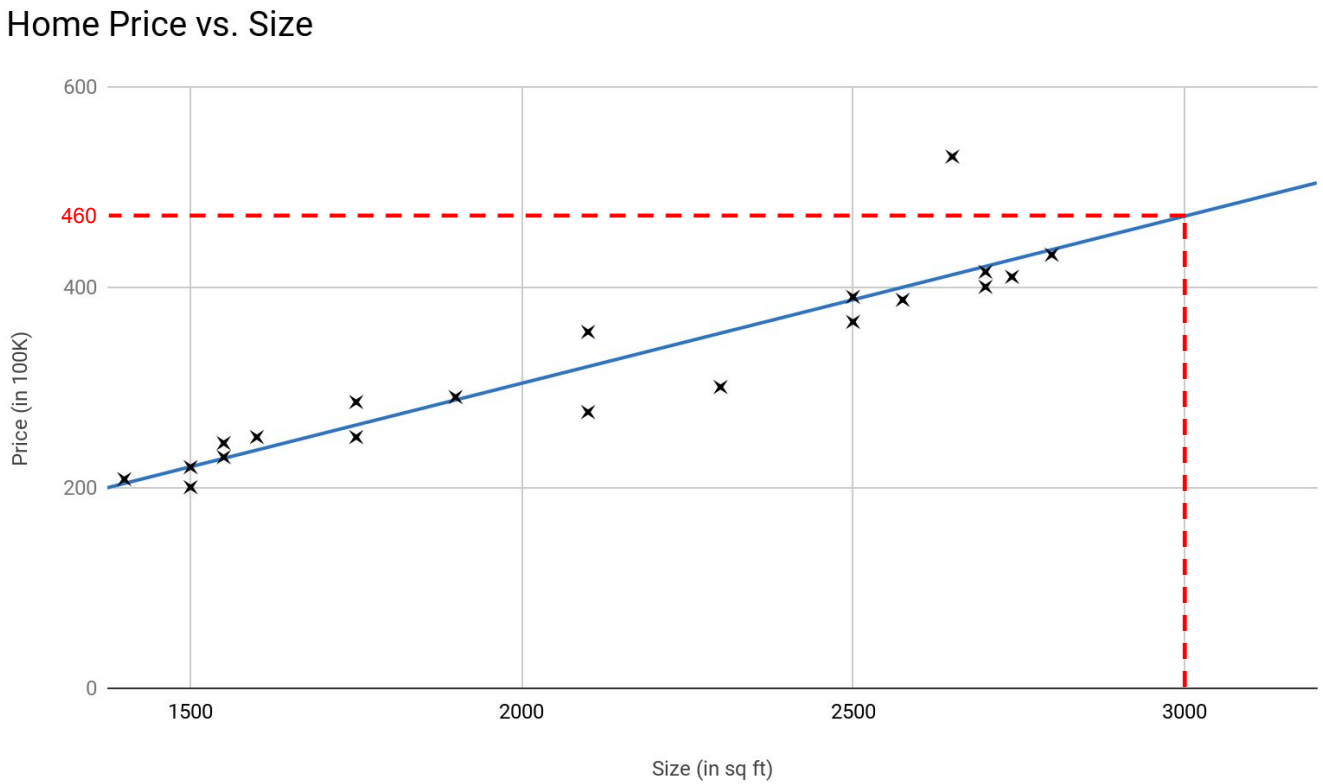
Machine Learning



Machine Learning



Machine Learning



For our use case, it is clear that we need a recommendation system.

Recommenders are a subclass of machine learning techniques that aim to predict a user's preference.

Content-Based Recommendation

- You have features that can capture the characteristics of an item (eg. the genre of a song).
- Recommend other items with similar characteristics.

Collaborative Filtering

- Make recommendations based on preferences of other users with similar tastes (collaboration).
- The features of items themselves are not important.

It is very common to have **hybrid recommender systems**, which use a combination of both content-based and collaborative filtering.

UX Principles of
Predictive UX

Why Predictive UX?

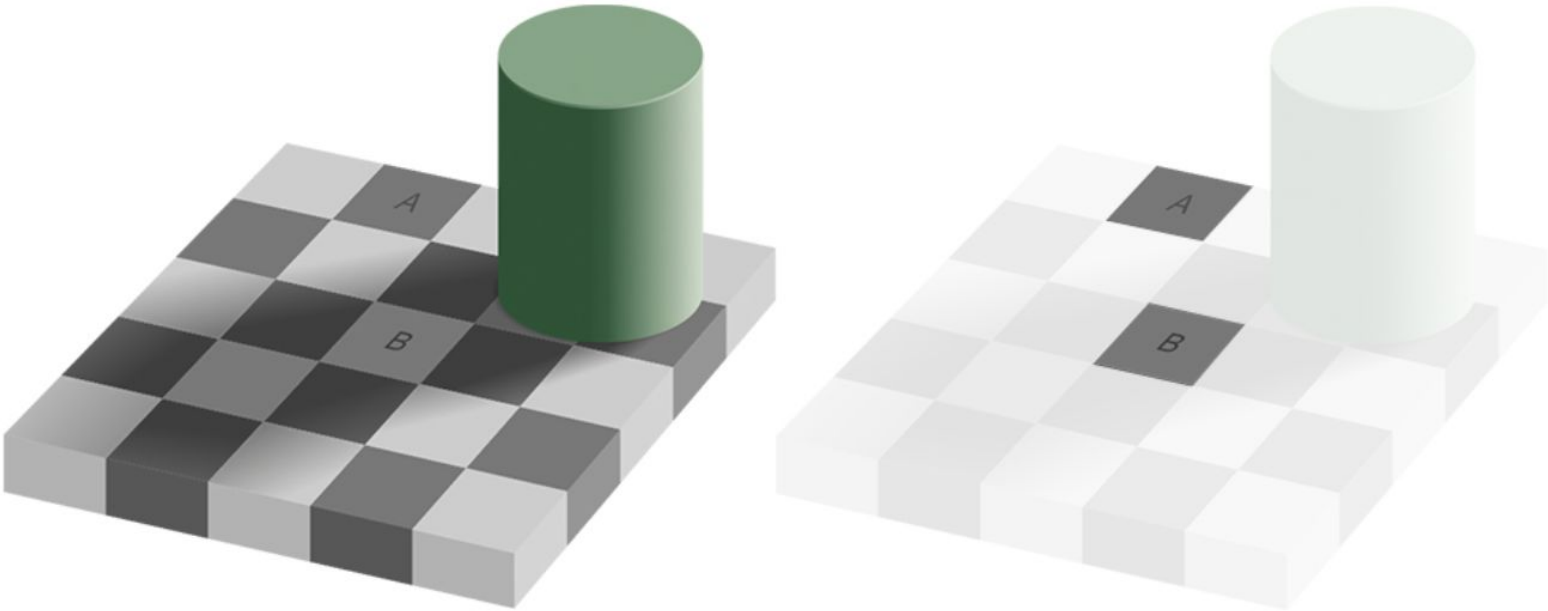
“This is about putting cutting-edge technology at the service of users so they can dedicate more time to the high-level processing tasks that modern living requires of them.”

— **Laura Busche,** Brand Content Strategist

The Challenge

Algorithms are binary and can’t understand the qualitative side of user decisions

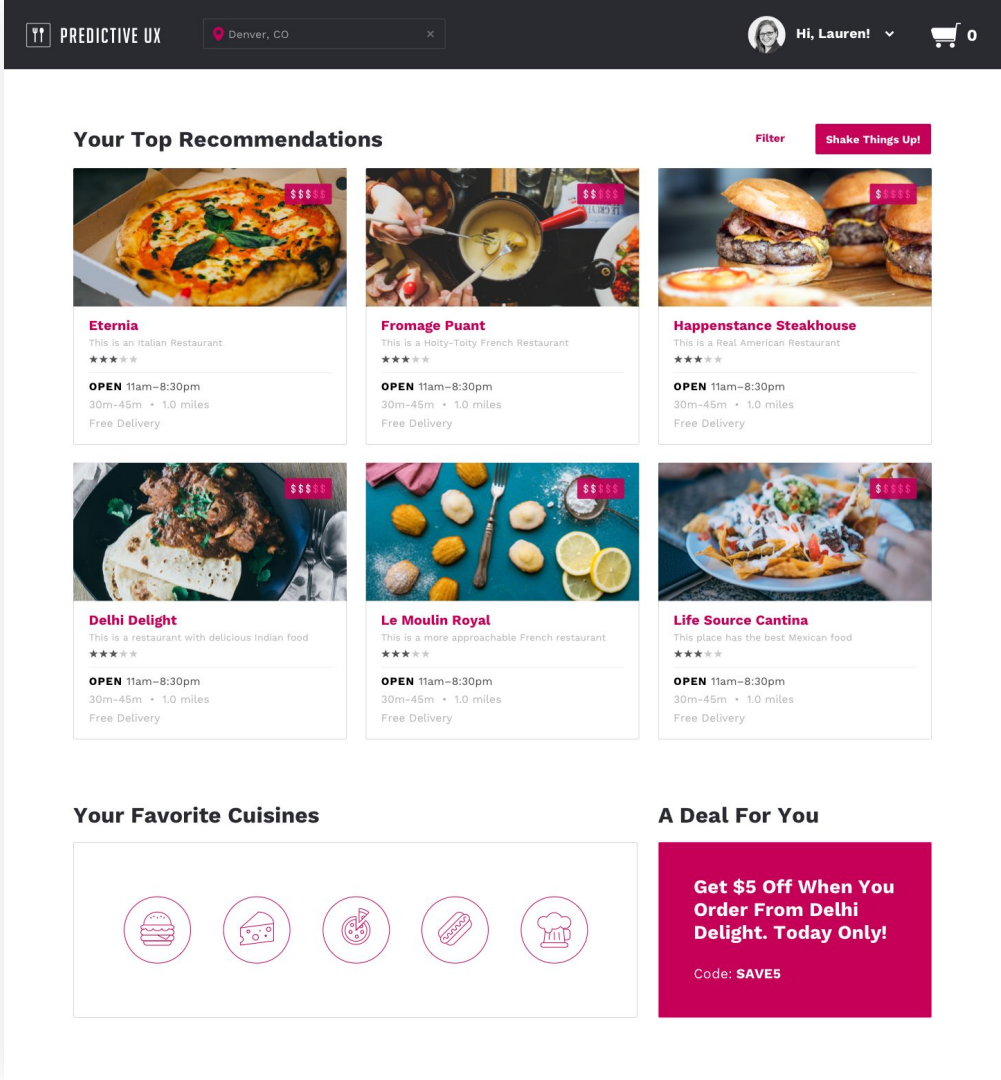
The Challenge



“**Bias and context** beat **analysis and content** when it comes to human perception.”

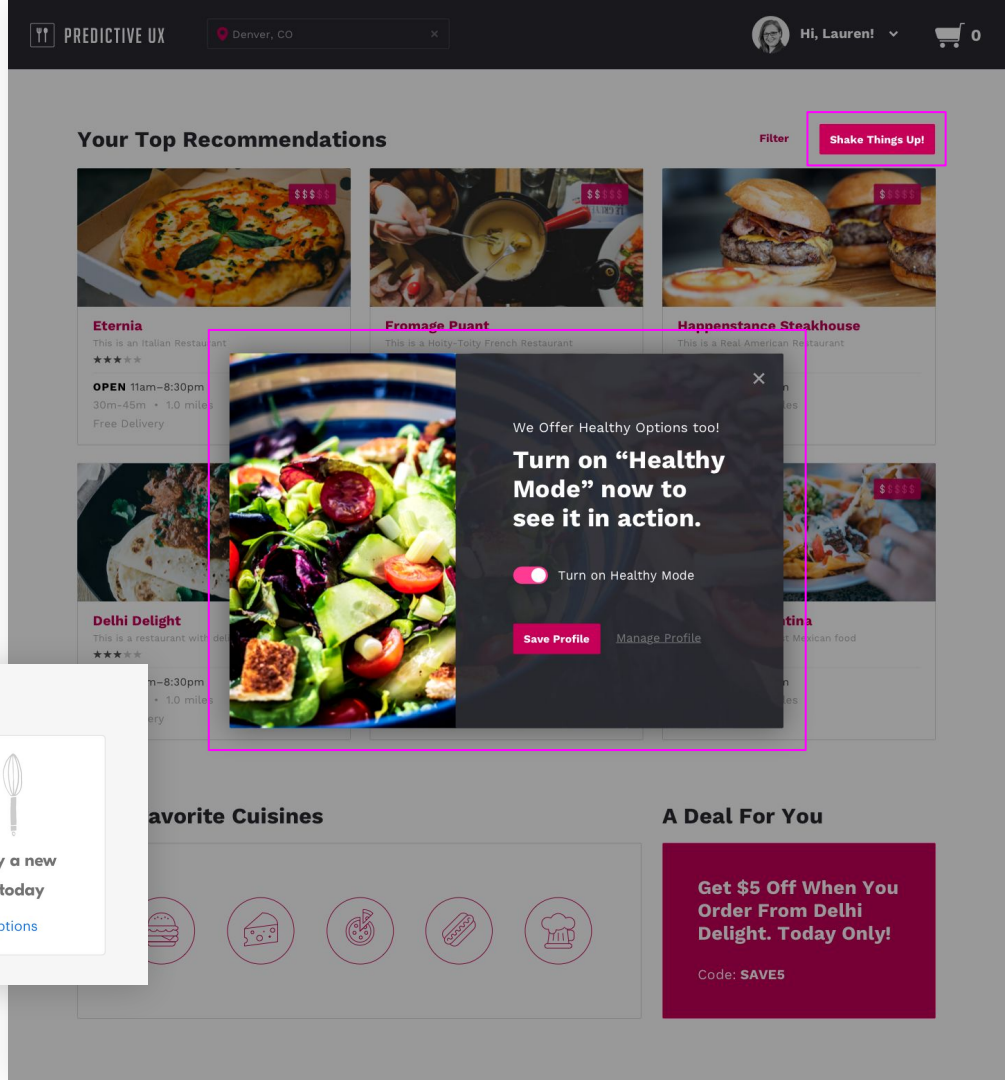
Principle 1

Create minimal interfaces with just enough content + design elements for the user's needs



Principle 2

Design Against the Experience Bubble

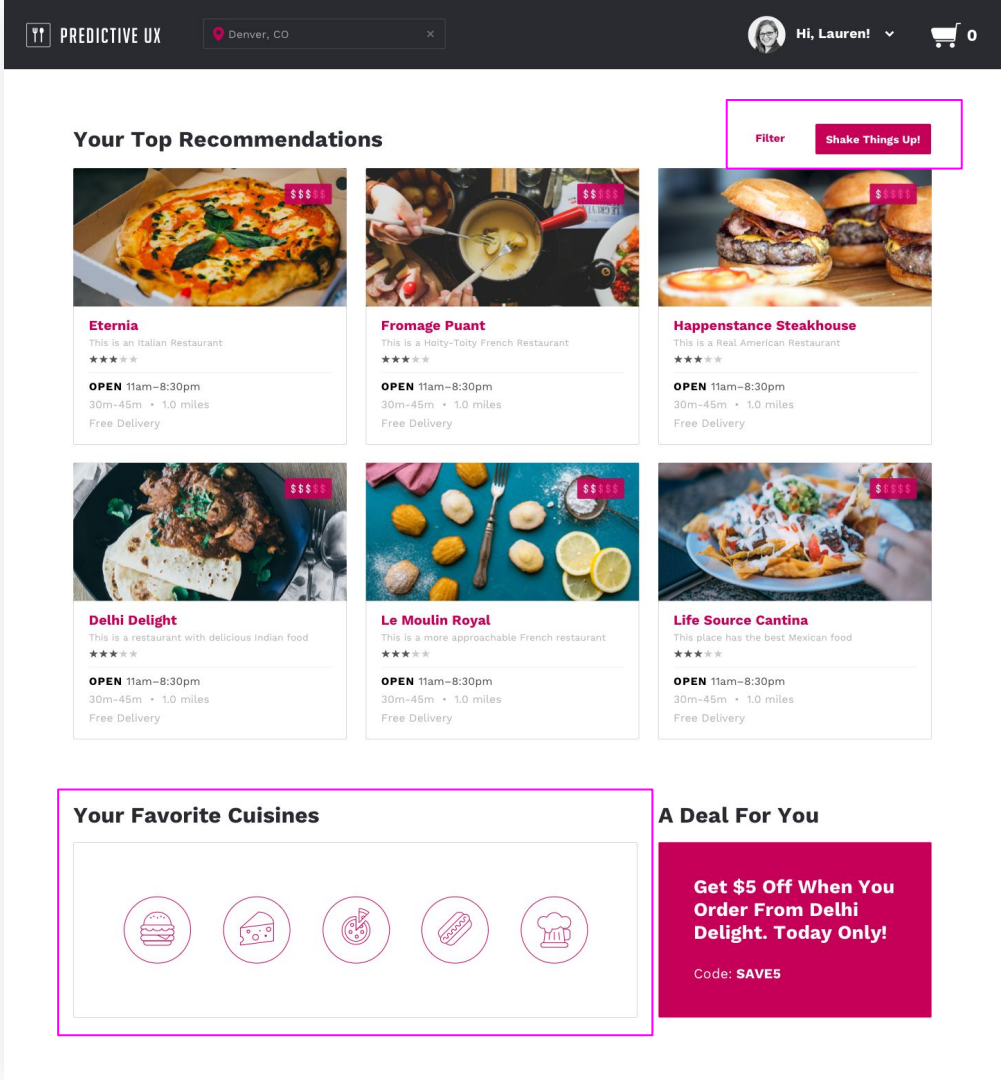


Principle 3

“Predictive” does not mean the same thing as“Control.”

Principle 3

Allow users to make as few choices as possible, without being pushy



Can This Be
Built in Drupal?

Why Drupal?

1. **Easy content management + data storage**
2. **Relatively smooth admin experience**
3. **API-first approach allows quick and easy integrations**

Can This Be Built in Drupal?

Apache PredictionIO

- Open-source
- Full machine learning stack
- Customizable templates
- Easily deploy as web service

PredictionIO

Recommenders | Classification | Regression | NLP | Clustering | Similarity | Other

Cstablo-template-text-similarity-classification

Star 7

Text similarity engine based on Word2Vec algorithm. Builds vectors of full documents in training phase. Finds similar documents in query phase.

Support: Github issues

Type	Language	License	Status	PIO min version	Apache PIO Convesion Required
Parallel	Scala	Apache Licence 2.0	alpha	0.9.5	requires conversion

Topic Labelling with Wikipedia

Star 9

This template will label topics (e.g. topic generated through LDA topic modeling) with relevant category by referring to Wikipedia as a knowledge base.

Support: Github issues

Type	Language	License	Status	PIO min version	Apache PIO Convesion Required
Parallel	Scala	Apache Licence 2.0	stable	0.10.0-incubating	already compatible

Text Classification

Star 29

Use this engine for general text classification purposes. Uses OpenNLP library for text vectorization, includes t.f.-i.d.f.-based feature transformation and reduction, and uses Spark MLLib's Multinomial Naive Bayes implementation for classification.

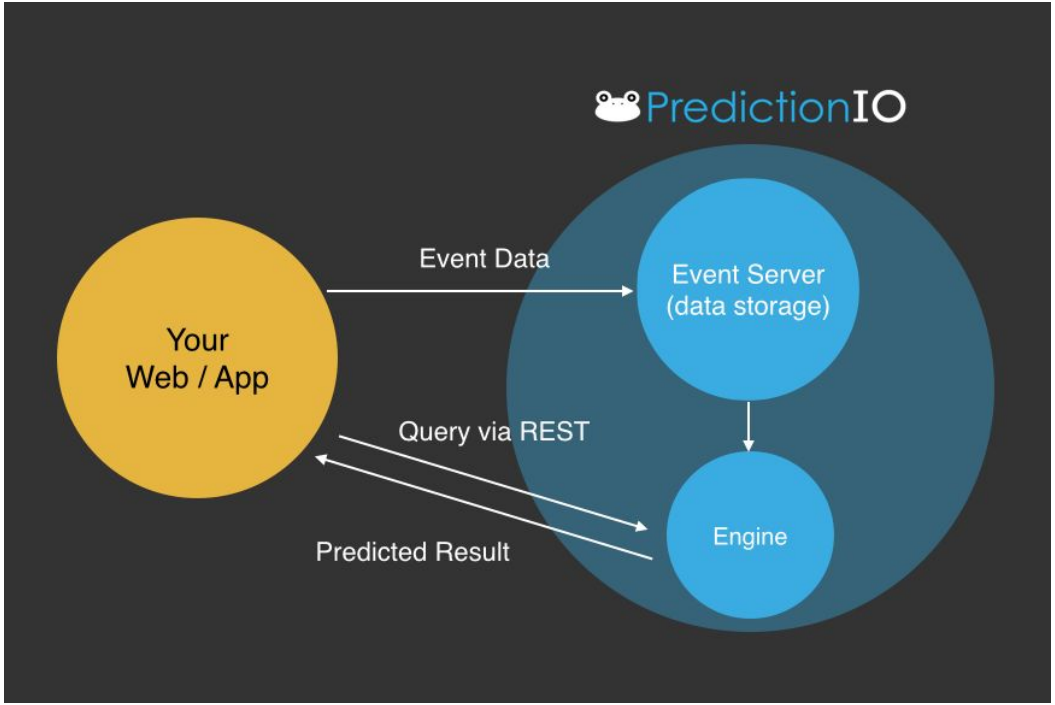
Support: Github issues

Type	Language	License	Status	PIO min version	Apache PIO Convesion Required
Parallel	Scala	Apache Licence 2.0	alpha	0.11.0-incubating	requires conversion

Can This Be Built in Drupal?

Event Server
Collects data from app and provides it to the engine.

Engine
Reads training data and builds a predictive model using machine learning algorithms.



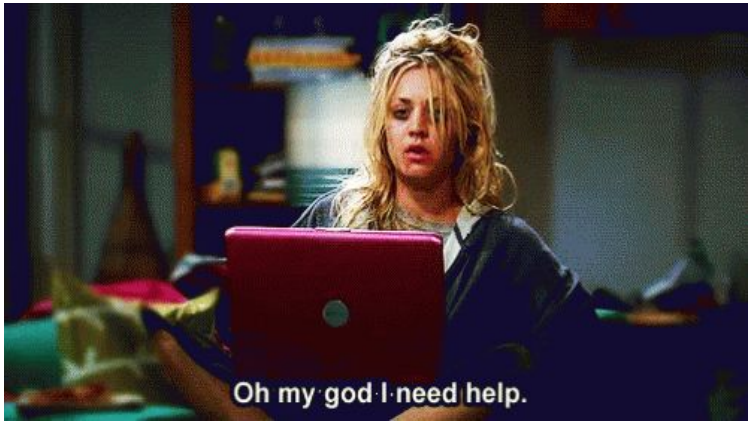
Can This Be Built in Drupal?

Explicit Data

- User explicitly provides information, like rating or buying an item

Implicit Data

- No explicit feedback; use information already available, like binge watching a show



Privacy Concerns + Ethics

“Privacy is at the heart of customer relationships; without the promise of keeping people’s data safe no one will oblige in giving access to that data.”

— Joël van Bodegraven

What’s Causing Trust Issues?

1

Personal data being sold on the black market

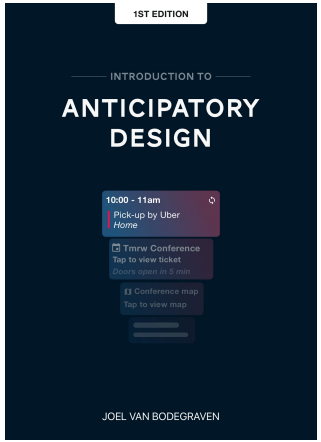
2

Trackers profile us and follow our every move

3

Forcing users to sign unfriendly privacy policies

Acknowledgements



Introduction to Anticipatory Design eBook

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Appendix

Development Tools

- Apache PredictionIO: https://predictionio.apache.org
- PredictionIO engine template gallery: https://predictionio.apache.org/gallery/template-gallery
- Creating custom Drupal modules: https://www.drupal.org/docs/8/creating-custom-modules
- REST API documentation: https://restfulapi.net

References

- Anticipatory Design
- https://www.nngroup.com/articles/customization-personalization/

Appendix

Interesting Reads

- “Instagram has a drug problem. Its algorithms are making it worse.” https://www.washingtonpost.com/business/economy/instagram-has-a-drug-problem-its-algorithms-make-it-worse/2018/09/25/c45bf730-bdbf-11e8-b7d2-0773aa1e33da_story.html

- “Why artificial intelligence is learning emotional intelligence” https://www.weforum.org/agenda/2018/09/why-artificial-intelligence-is-learning-emotional-intelligence

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Thank You!

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