



# CAN YOU CHURN IT DOWN?

DAIHONG CHEN

JAROD CARROLL

MIHIR BHAGAT

# PROJECT GOAL: PREDICT CHURN RATE

## DATA INCLUDED

T-MOBILE (LAST 3 YEARS)

CHURN RATE:  71%

STOCK PRICE:  538%

ACCOUNT LENGTH

LOCATION (STATE)

PHONE NUMBER

PLAN: INT'L, VOICE PLAN

MINUTES: DAY, EVENING, NIGHT

TOTAL CHARGES

CELL PHONE INDUSTRY

ACQUISITION COST: \$350

RETENTION COST: \$50

# OUR PROCESS



DATA: KAGGLE



DESIGN: PANDAS & SKLEARN



PRE-PROCESS: CATEGORICAL → BINARY

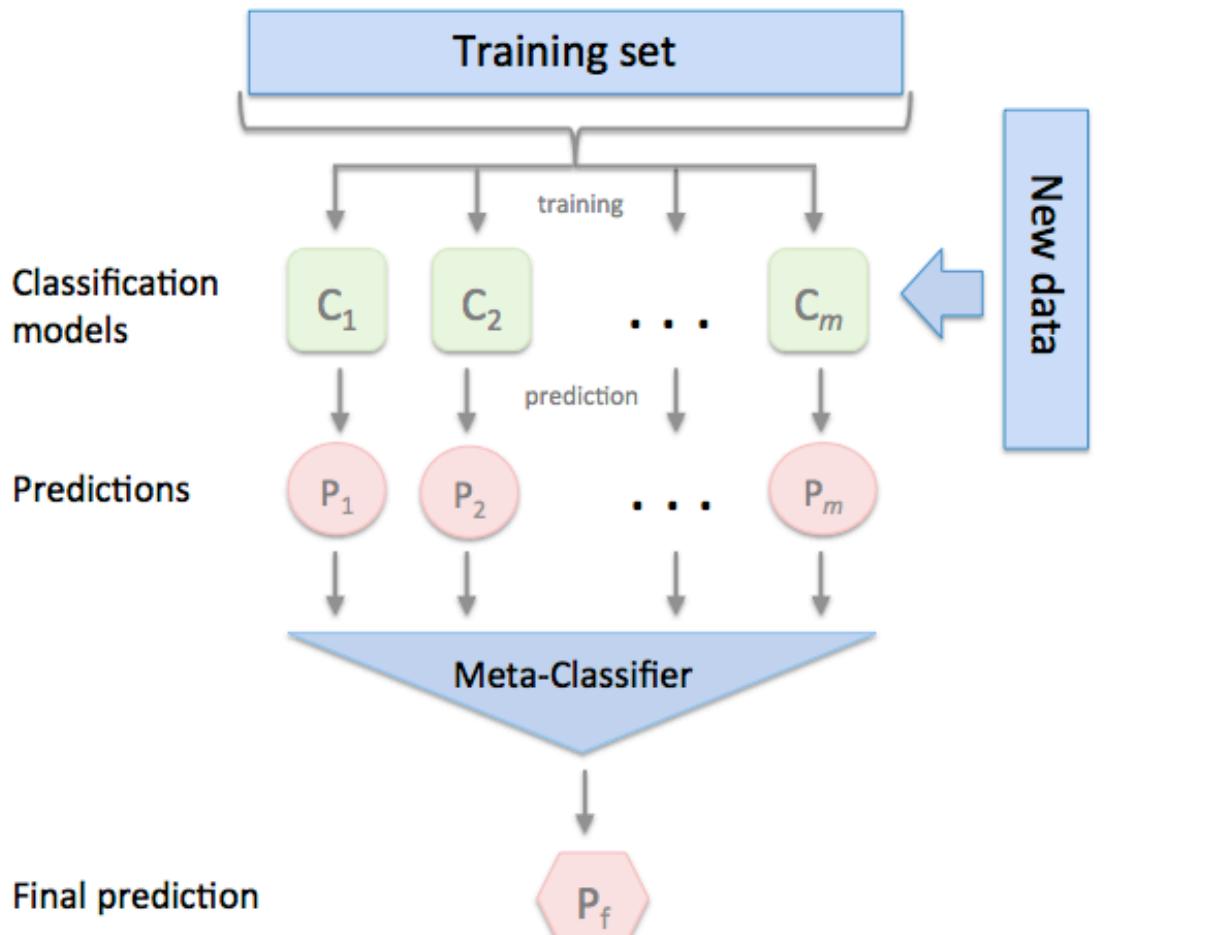
INT'L PLAN, VOICE MAIL PLAN



FEATURE ENGINEERING

REMOVED PHONE NUMBER AND STATE, ADDED TOTAL CHARGE

# WHAT IS STACKING?



ENSEMBLE MODEL

COMBINES MULTIPLE CLASSIFICATION MODELS

# BASELINE MODEL

RANDOM FOREST

K-NEAREST NEIGHBORS

GRADIENT BOOSTING

STACKING MODEL  
(VIA LOGISTIC REGRESSION)

# FINAL MODEL

LOGISTIC REGRESSION

RANDOM FOREST

GRADIENT BOOSTING

STACKING MODEL  
(VIA LOGISTIC REGRESSION)

REPLACED K-NN

FEATURE ENGINEERING  
➤ DROPPED STATE  
➤ ADDED TOTAL CHARGE

# MODEL IMPROVEMENT

	BASELINE MODEL	FINAL MODEL
ACCURACY SCORE	.938	.984
PRECISION	.811	1.0
RECALL	.793	.888
F-1 SCORE	.802	.934

# OPTIMIZING FOR RECALL



OF THE CUSTOMERS WHO WILL CHURN, HOW  
MANY DID WE IDENTIFY?

89%

\*BASELINE → FINAL: 12% IMPROVEMENT



# FLASK APPLICATION



# RECOMMENDATIONS

## DATA COLLECTION

NON-CALL USAGE  
CUSTOMER DEMOGRAPHICS

## CLV

PRIORITIZE CUSTOMERS  
FACTORS  
PROFIT  
LIFESPAN  
DISCOUNT RATE (8%)  
REFERRAL VALUE

## INCENTIVES

NETWORK EXTENDERS  
BUNDLING PARTNERSHIPS  
FAMILY DISCOUNTS

## ZERO-SUM GAME

INCREASE COST TO SWITCH (FAMILY CONTRACT)  
DECREASE COST TO CONVERT (PAY BUYOUT)