A photograph of three young boys of diverse backgrounds looking intently at tablets in a classroom setting. The boy on the left is wearing a white shirt, the middle boy is in a blue polo shirt, and the boy on the right is in a dark blue polo shirt. They are all focused on the screens of their devices.

# Auto-Screening *Donors Choose* Posting Requests

Justin Mao-Jones

Charlie Guthrie

Lucy Wang

Yasumasa Miyamoto



# Donors Choose.org

Teachers ask. You choose.

DonorsChoose.org makes it easy to help classrooms in need. Public school teachers post classroom project requests which range from pencils for poetry to microscopes for mitochondria.



# A crowd-funding site for school projects

Since inception in 2000...

- **\$283 million** to school projects
- fully funded **70%** of **650,000** posted projects
- **1.5 million** supporters
- **200,000** teachers
- **13 million** students

## Teach For the Planet: Printing For Understanding ♥

Mr. Katz's technology project at Whitney Young Magnet High School in Chicago, IL | Highest Poverty



**My Students:** "In the end we will conserve only what we will love. We will love only what we understand. We will understand only what we have been taught." Baba Diom

My students need a 3D printer and scanner, along with filament, to build and design ... [▶ more](#)

We are working to create an incredible opportunity, to create a professional collaborative project, between 10th-12 AP Environmental Science students, 11th-12th grade AP 2D Studio Art students, and 10th-12th grade Sculpture and Ceramics ... [▶ more](#)

**My students need** a 3D-Printer, PLA and ABS filament, and a digitizer Desktop 3D scanner.

any amount

**Give**

\$169 to go  
35 donors

Half-off thanks to



Save

Share ▼

materials	vendor	price	#	total
MakerBot Replicator Desktop 3D Printer	Nasco	\$2,899.00	1	\$2,899.00
MakerBot Digitizer Desktop 3D Scanner	Nasco	\$799.00	1	\$799.00
1.75 mm PLA Filament for 3D Printers - Black	Nasco	\$29.95	3	\$89.85

# Getting a Project Posted



**DonorsChoose.org**  
Teachers ask. You choose.



Teacher



Screener

Looks  
Fine

## Criteria:

- Be real
- Benefit students
- Explain why funding is needed
- Spell-checked
- Follows website rules

"Needs Revisions"

# Preprocessing

**145,677** requests in 2014



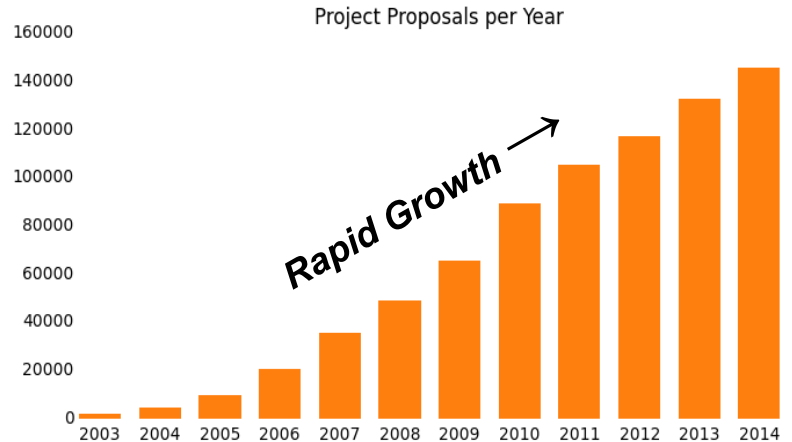
**50** volunteers



**15** minutes/project

**37,500** hours of review per year

The current screening process is unsustainable given the rapid growth of the organization



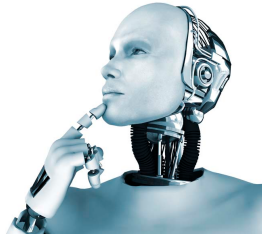
# Automated Processing



Donors Choose.org  
Teachers ask. You choose.



Teacher

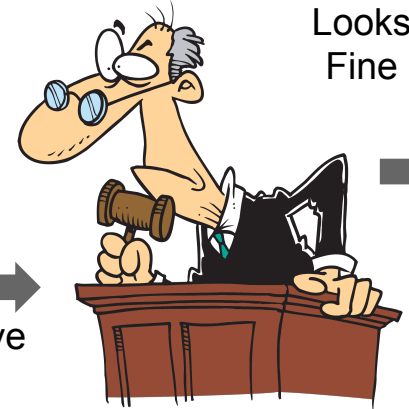


Robo -Screener

Looks  
Fine



May Have  
Issues

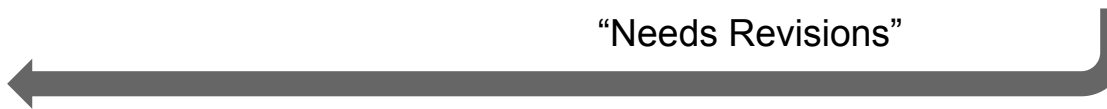


Screener

Looks  
Fine



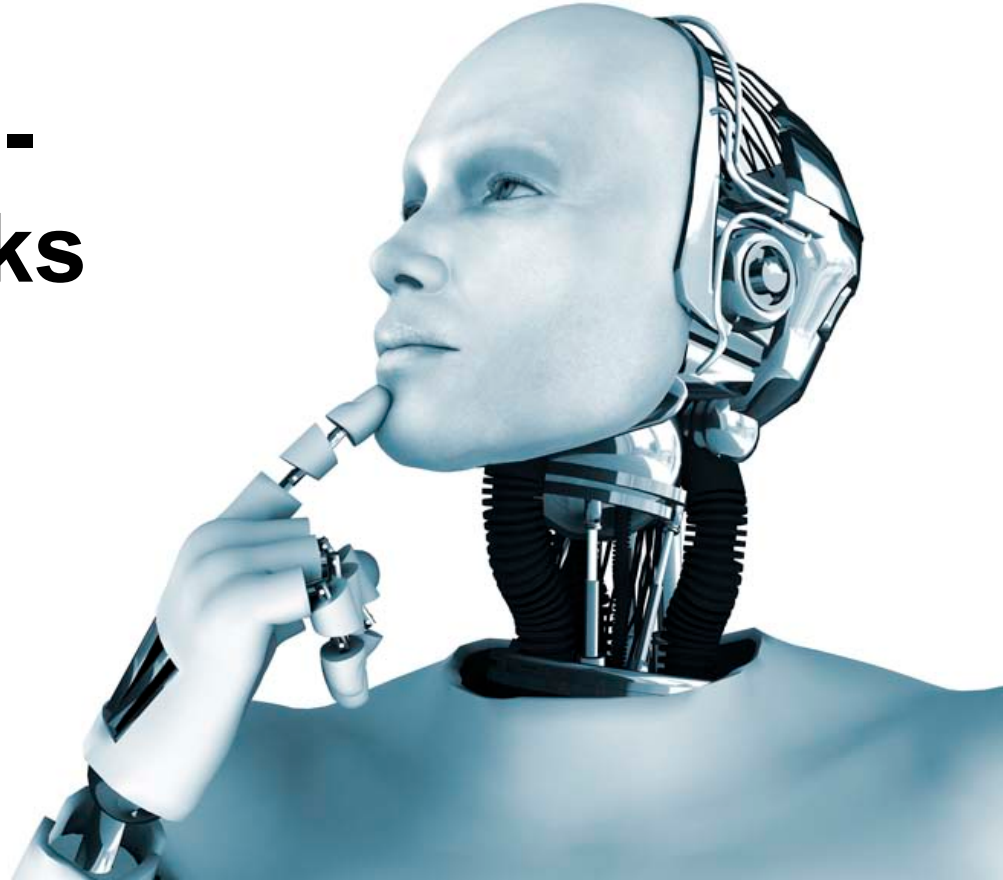
“Needs Revisions”



***Doesn't have to be perfect: 30% reduction = 6,000 hours***



# How the Robo-Screener Works





# Teach For the Planet: Printing For Understanding ♥

Mr. Katz's technology project at Whitney Young Magnet High School in Chicago, IL | Highest Poverty



**My Students:** "In the end we will conserve only what we will love. We will love only what we understand. We will understand only what we have been taught." Baba Diom

My students need a 3D printer and scanner, along with filament, to build and design ... [▶ more](#)

We are working to create an incredible opportunity, to create a professional collaborative project, between 10th-12 AP Environmental Science students, 11th-12th grade AP 2D Studio Art students, and 10th-12th grade Sculpture and Ceramics ... [▶ more](#)

**My students need** a 3D-Printer, PLA and ABS filament, and a digitizer Desktop 3D scanner.

any amount

**Give**

\$169 to go

35 donors

Half-off thanks to



Save

Share ▼

materials

vendor

price

#

total

MakerBot Replicator Desktop 3D Printer

Nasco

\$2,899.00

1

\$2,899.00

MakerBot Digitizer Desktop 3D Scanner

Nasco

\$799.00

1

\$799.00

1.75 mm PLA Filament for 3D Printers - Black

Nasco

\$29.95

3

\$89.85

# Teach For the Planet: Printing For Understanding

Title

Mr. Katz's technology project a

project type

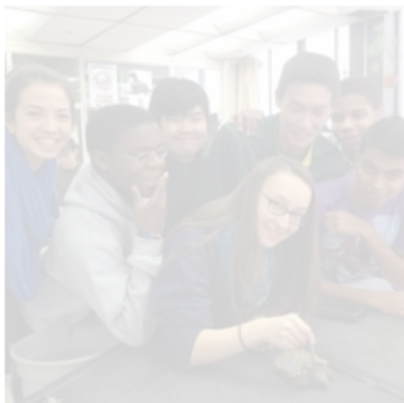
agnet

location

in Chicago, IL

Highest Poverty

poverty level



**My Students:** "In the end we will conserve only what we will love. We will love only what we understand. We will understand only what we have been taught." Baba Diom

My students need a 3D printer and scanner, along with filament, to build and design ... [▶ more](#)

We are working to create an incredible opportunity, to create a professional collaborative project, between 10th-12 AP I Science students, 11th-12th grade AP 2D Studio Art stu 12th grade Sculpture and Ceramics ... [▶ more](#)

Essay

**My students need** a 3D-Printer, PI Desktop 3D scanner.

Need Statement

any amount

Give

\$169 to go

35 donors

Half-off thanks to



Save

Share ▼

materials	vendor	price	#
MakerBot Replicator Desktop 3D Printer	Nasco	\$2,899.00	1
MakerBot Digitizer Desktop 3D Scanner	Nasco	\$799.00	1
1.75 mm PLA Filament for 3D Printers - Black	Nasco	\$29.95	3

total

\$2,899.00

requested funds

0

5

# Text Analysis: Sample Essay

**Spelling errors**

"This field trip is for our Student Council. Our new council will be stepping up as leaders. My kids wulod like to have the oportunity to grow as learners. It will help my student council learn how to lead our school and do StuCo duties. The field trips would be \$200 for transportation and \$20/student for the event. This field trip could help my students. For more information and pictures, send me an email at [clupone@gmail.com](mailto:clupone@gmail.com) or visit <http://stuco.stamfordschools.edu>"

**Specific prices**

**Emails and URLs**

**Missing Need Statement**

My students need \_\_\_\_\_

**Term Frequencies**

term	freq.
student	3
need	2
council	2
etc...	

# Our Model

## Project Data

- school location
- poverty level
- project type
- grade level
- class subject
- resource type
- school type
- funding request

## Extracted Essay Features

- dollar signs
- @ symbol, url
- missing values
- essay length

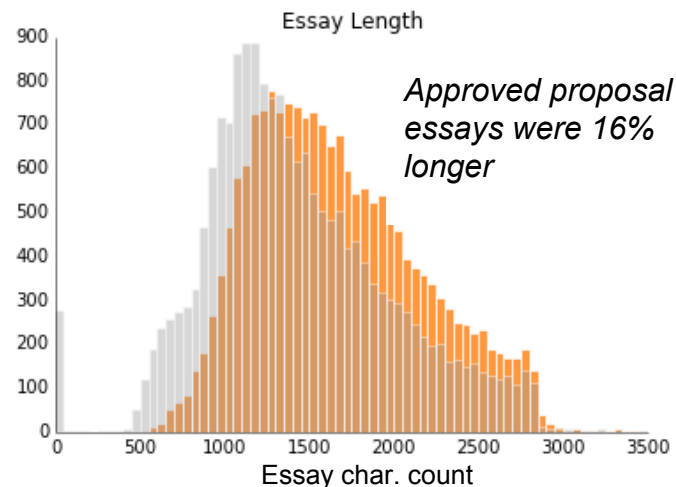
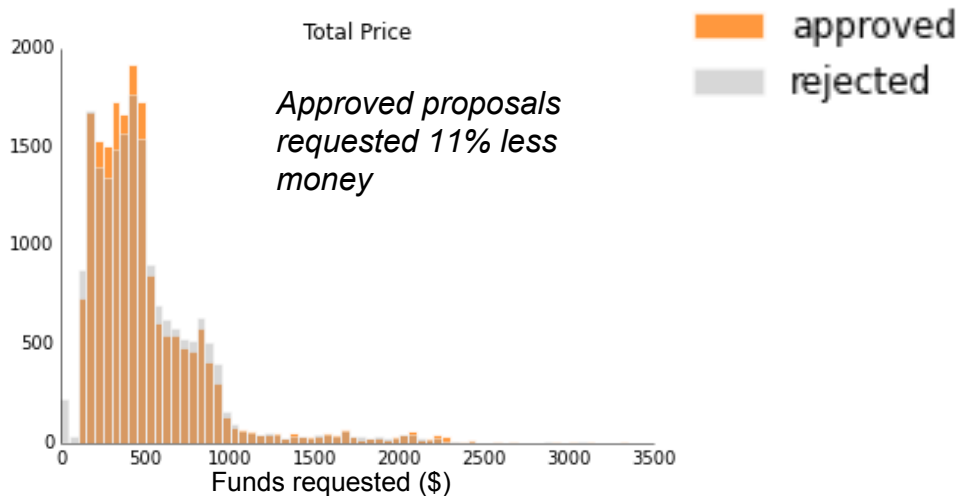
## Matrix of Essay Term Frequencies

$$\begin{pmatrix} & T_1 & T_2 & \dots & T_t \\ D_1 & w_{11} & w_{21} & \dots & w_{t1} \\ D_2 & w_{12} & w_{22} & \dots & w_{t2} \\ \vdots & \vdots & \vdots & & \vdots \\ \vdots & \vdots & \vdots & & \vdots \\ D_n & w_{1n} & w_{2n} & \dots & w_{tn} \end{pmatrix}$$

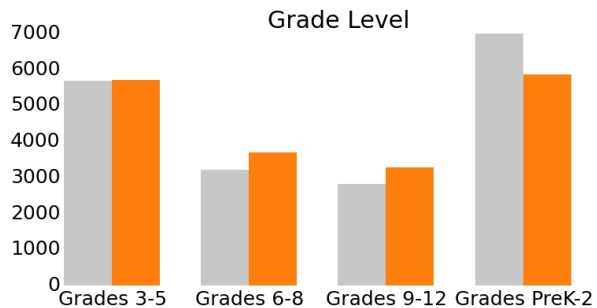


**logistic  
regression  
model**

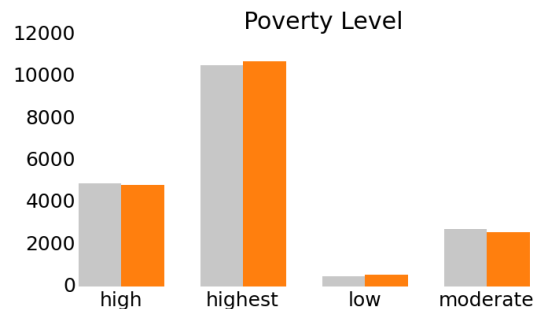
**Proposal  
Approval or  
Review**



*Proposals for grades K-5 are 8% more likely to be approved*



*Proposals from low-poverty schools were slightly less likely to be approved*



**Model → Impact**

# Model Performance

## Test Environment

Thresholds



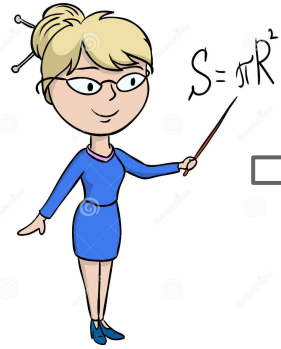
Good Projects Approval Rate	Bad Projects Approval Rate
5%	1%
15%	5%
25%	10%

## Business Case



What is the appropriate threshold?

# Data Challenge



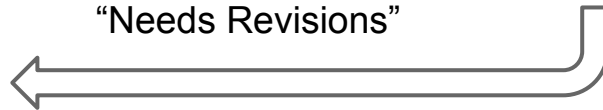
Teacher



Project  
Request



Screener

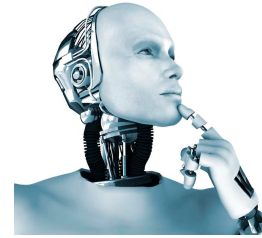


"Needs Revisions"

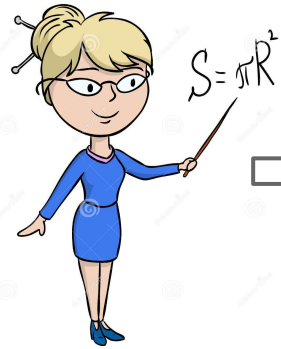


# Data Challenge

Reality  
18%  
need revision



Current Data  
3%  
need revision



Teacher

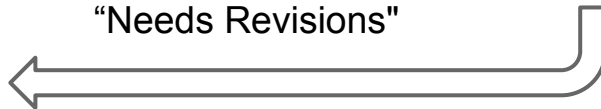


**Next  
Revision**



Screener

**Previous Revision**



"Needs Revisions"

# What does this mean?

Exploratory  
Analysis



**Better Data  
+  
Detailed  
Analysis**



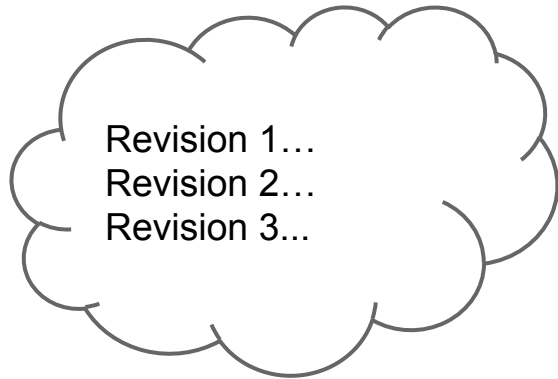
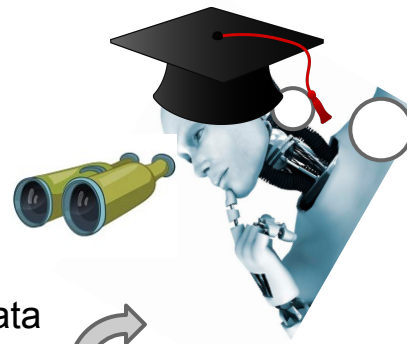
Scalable  
Production  
System



+

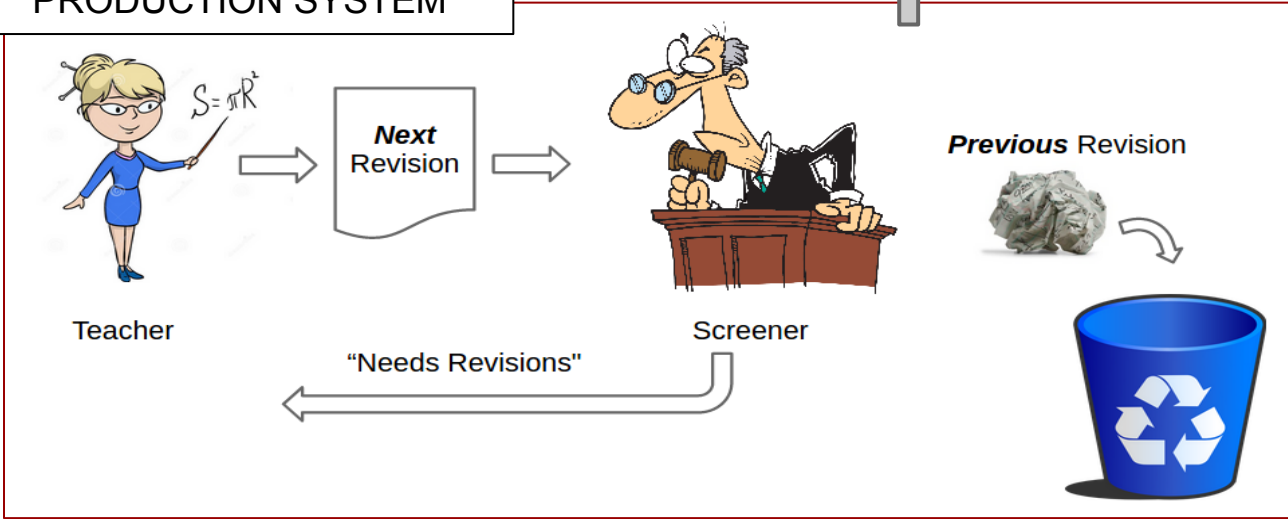


# More Testing Recommended



Pull Data Frequently

PRODUCTION SYSTEM



# Next Steps

Testing in parallel to production system

## Low Hanging Fruits

- Detect 'text' not allowed in proposals, warn teachers  
email addresses, url links, prices, etc.
- 'Flag this project' button

## Business Case Discussions

- What is the right threshold for approvals?
- What are the costs vs benefits in the production system?

Questions?

**Thank You!**