



# AI-POWERED DONATION MATCH REVIEW

Sponsor: Benevity Inc.

Kameshwara Sekar, Viet Long Ta, Junhao Xue,  
Hoang Long Tran, Jade Fjestad

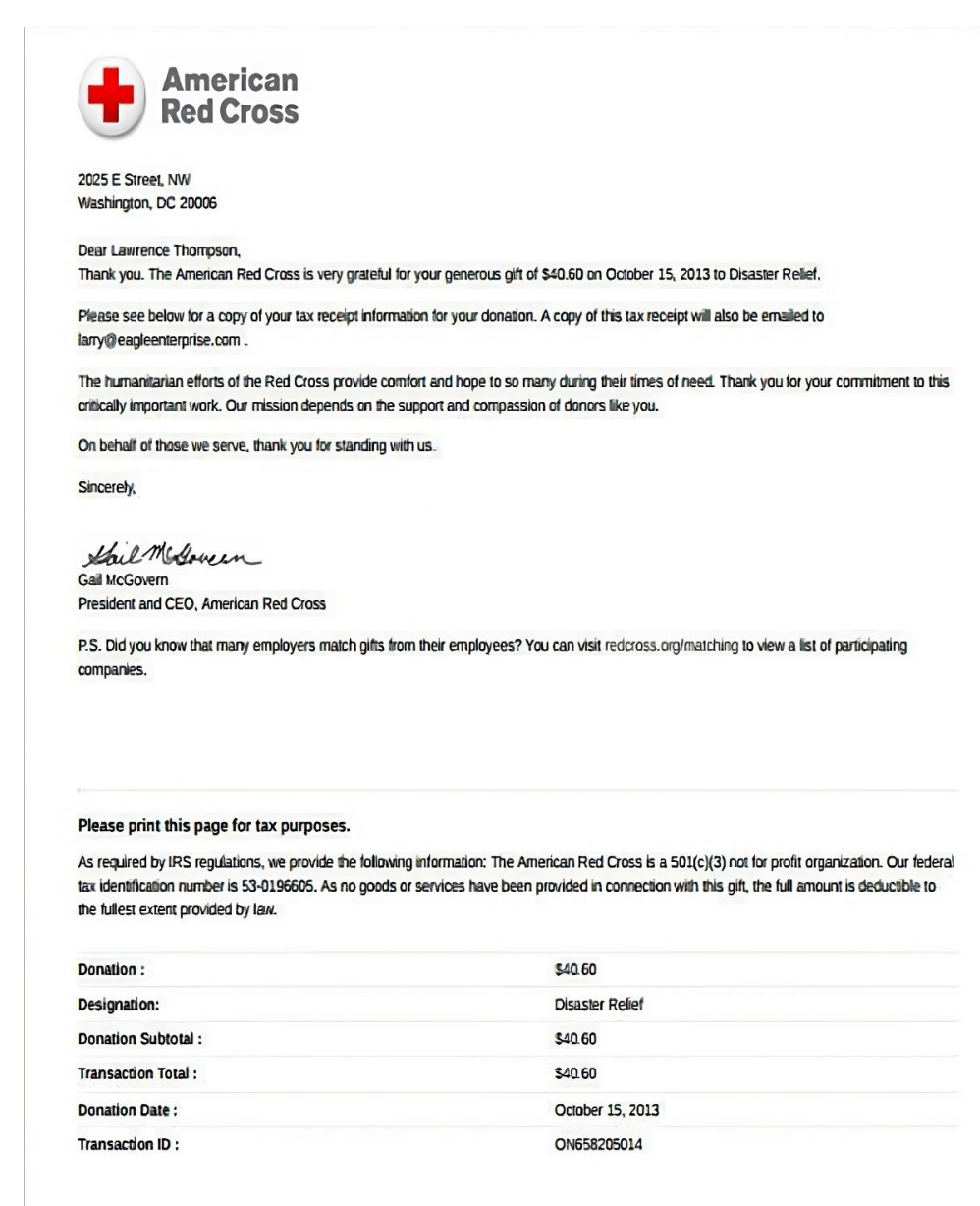
## Introduction

- Company donation matching programs are limited due to the high cost of manual review.
- There is an opportunity to use machine learning to reduce the time required for human review.
- The sponsor, Benevity Inc. provided us with the data required to automate this process.

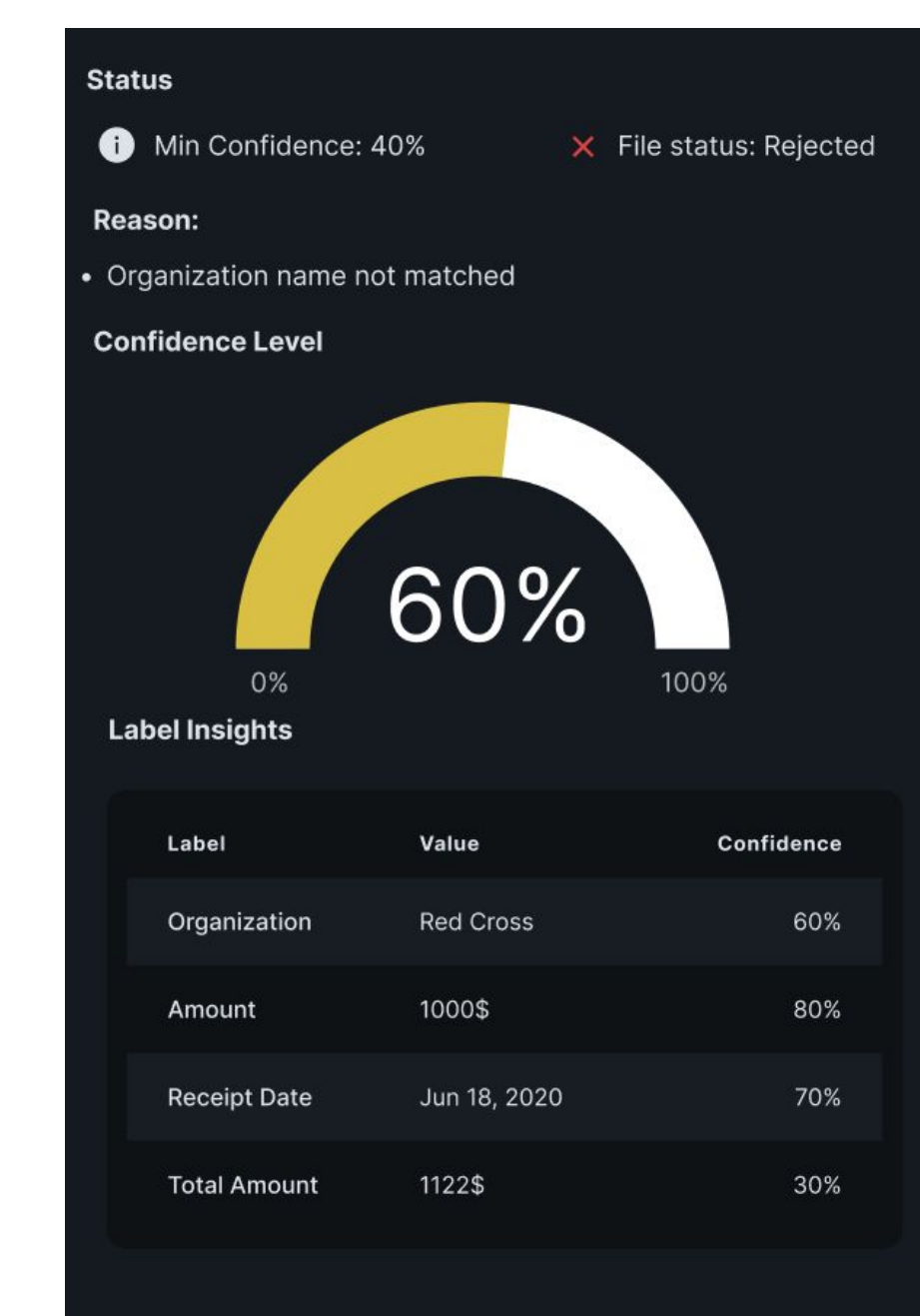
## Methods

- Extracting receipt text using Optical Character Recognition library Tesseract.
- Spacy to train custom Named Entity Recognition model for extracting important data from document.
- Verify extracted data against user submissions.

## Automated Review Process



American Red Cross ORG 2025 E Street, NW Washington, DC ADD 20006 Dear Lawrence Thompson PER  
 , Thank you. The American Red Cross ORG is very grateful for your generous gift of \$40.60 MON on  
 October 15, 2013 DAT to Disaster Relief ORG . Please see below for a copy of your tax receipt information  
 for your donation. A copy of this tax receipt will also be emailed to lary@eagleenterprise.com The humanitarian  
 efforts of the Red Cross provide comfort and hope to so many during their times of need Thank you for your  
 commitment to this critically important work. Our mission depends on the support and compassion of donors like  
 you. On behalf of those we serve, thank you for standing with us. Sincerely, Gail McGovern PER President and  
 CEO, American Red Cross ORG P.S. Did you know that many employers match gifts from their employees? You  
 can visit redcross.org/matching to view a list of participating companies. Please print this page for tax purposes. As  
 required by IRS regulations, we provide the following information: The American Red Cross ORG is a 501(c)(3)  
 not for profit organization. Our federal tax identification number is 53-0196605 TAX . As no goods or services  
 have been provided in connection with this gift, the full amount is deductible to the fullest extent provided by law.  
 Donation : \$40.60 MON Designation: Disaster Relief Donation Subtotal : \$40.60 MON Transaction Total :  
 \$40.60 MON Donation Date : October 15, 2013 DAT Transaction ID : ON658205014



## Results

(based on 75 random samples)

- Potential Automation Rate: **52.0%**
- Accuracy: **70.6%**
- Specificity/Precision rate: **100%**
- Sensitivity/Recall rate: **63.9%**
- It was a priority to minimize the False Positives as that could lead the company to fraud.

## Name Entity Recognition Scores

Label	F1 Score
Person Name	74.4
Date	89.7
Money	100.0
Organization	63.4
Tax ID	66.7
Address	66.7
Country	100.0

## Full Process Results

		Actual	
		Positive	Negative
Predicted	Positive	39	0
	Negative	22	14

## Conclusion

- We are able to reduce the manual work load significantly.
- Valuable insights are given to reviewer of failed documents.
- This has the potential to reduce the cost of reviewing corporate donation matching significantly.