



Automatic Identification of Suicide Notes

from Linguistic and Sentiment Features

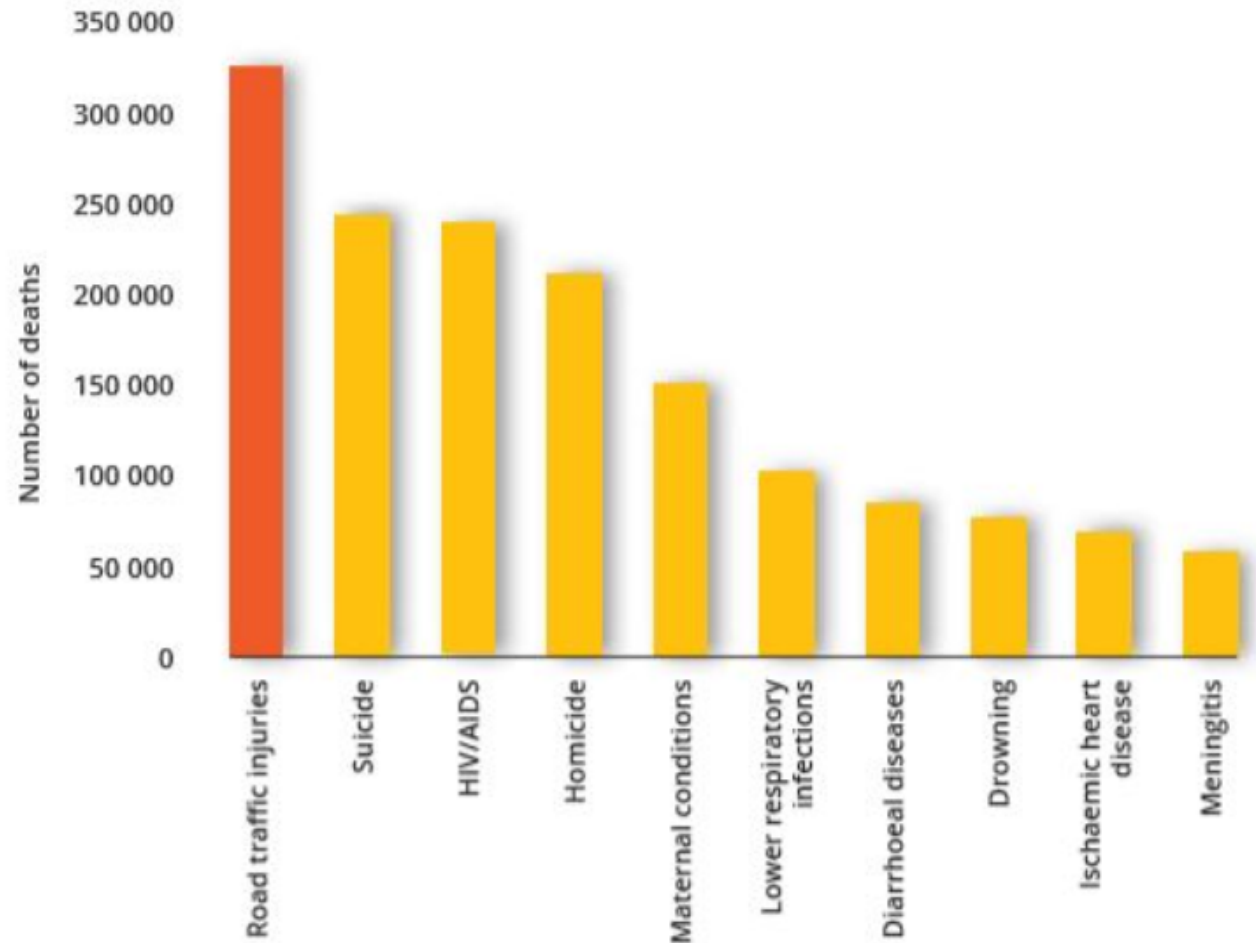
Importance

40

Close to
800 000
people die by **suicide**
every year



Top ten causes of death among people aged 15–29 years, 2012



Suicide Leads

- Trend:
 - Publish suicide notes in social media
 - Express suicidal feelings online
- Language represents shifting in psychological states



Cynthia Lee

leon aka my " dad" your A GOOD FOR NOTHING DRUG CHEATING LOSER I HATE YOU YOUR NOT ALOUD AT MY FUNERAL DUDE FOR REAL! to anyone else who was real to me im very sorry i cant handle this shit anymore..... RYAN DAVID HARDWICK i love you with all my heart but every time we get caught talking you go to jail i will NOT ever be a reason you go there again my pain is too strong to strong to handle any longer im so sorry for hurting you just know U R MY TRUE LOVE... mom here i come

Share · 17 hours ago · 🌐

Social Network Application

- Facebook – User reporting

NEW FACEBOOK FEATURE

Facebook updated some tools that provide more resources, advice and support to people who may be struggling with suicidal thoughts and their concerned friends and family members.

STEPS

YOU REPORT IT

FACEBOOK ASKS YOU IF YOU WANT TO

- GET TIPS
- CONTACT A FRIEND
- ASK FACEBOOK TO HELP CONTACT THEM

SOURCE: FACEBOOK & GRAPHIC BY ANTHONY ESTOLAND/THE DAILY TOREADOR

- Google – Automatic detection

experience project group i fight depression and loneliness everyday

הגדרות עזרה סרטונים חדשות תמונות הכל

כ-36,900,000 תוצאות (0.60 שניות)

Israel Suicide Hotlines - Suicide.org!

תרגום דף זה www.suicide.org/hotlines/international/israel-suicide-hotlines.html

Depression & Suicide · Bipolar Disorder & Suicide · Schizophrenia & Suicide · PTSD & Suicide · Postpartum Depression & ... Suicide Survivors Support Groups ...

suicide

הגדרות עזרה מפות סרטונים חדשות תמונות הכל

כ-248,000,000 תוצאות (0.46 שניות)

זקוק לעזרה? ישראל:

1201

ער"ן - עזרה ראשונה נפשית

שעות פעילות: 24 שעות, שבעה ימים בשבוע

שפות: עברית, עברית

אתר: www.eran.org.il

Related Works

- Provide evidence to genuine notes (manual)
- Sentiment features (manual)
- Models based on linguistic only (auto)
 - structural features (nouns, adj., length)
 - 82% prediction
- New work –
combining features
disorders notes

+

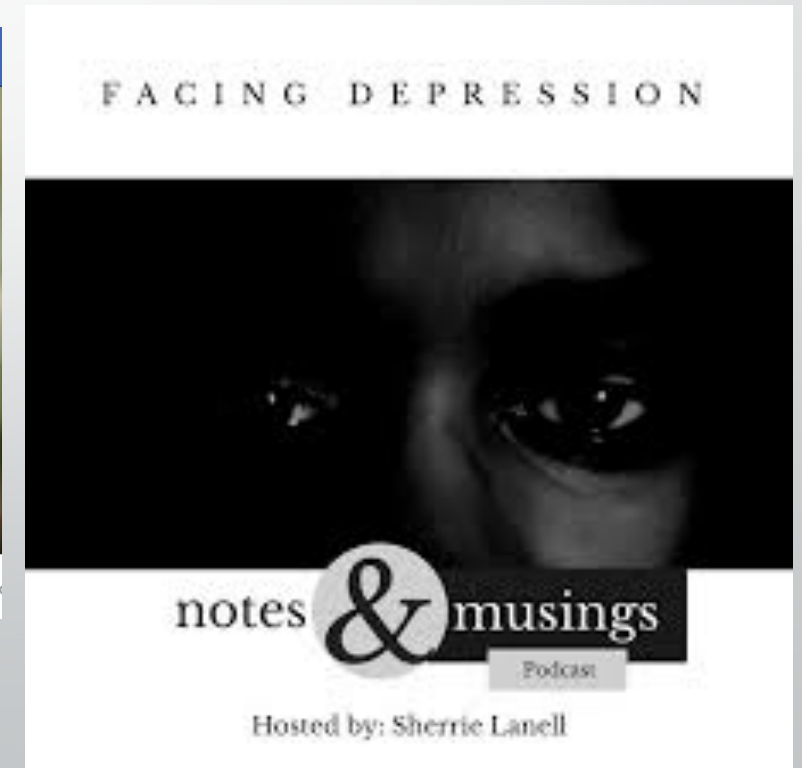
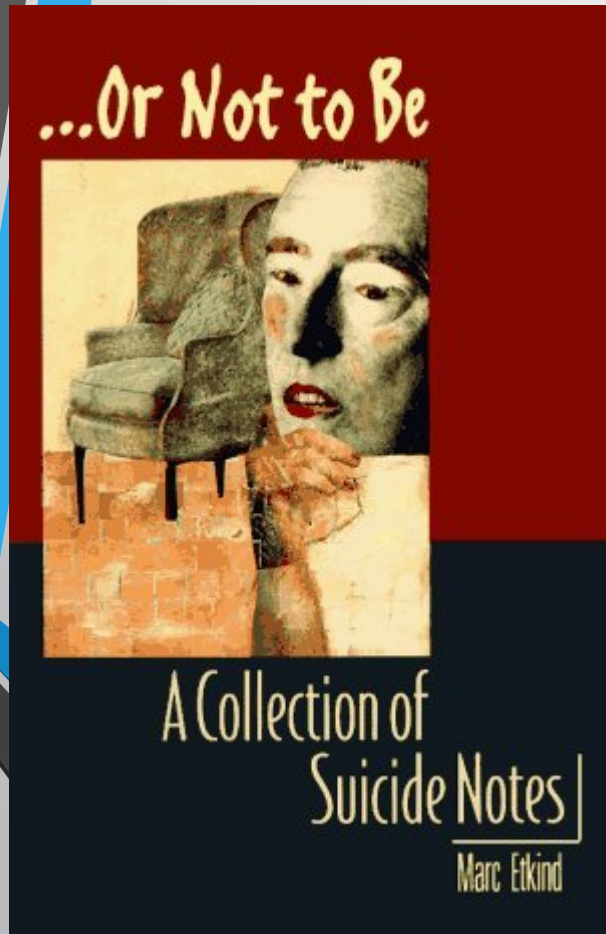


Genuine / Fake Notes



Suicide / other

Data Collection



Suicide Note Purpose

- Current feeling
- Apologize
- Instructions

-
- To comfort the survivors

Level \ Type of self disclosure

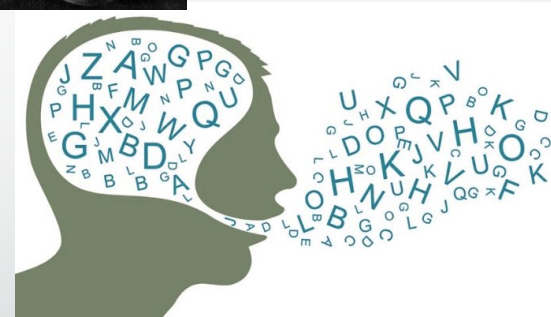


Features

- Sentiments



- Linguistic



- Statistics



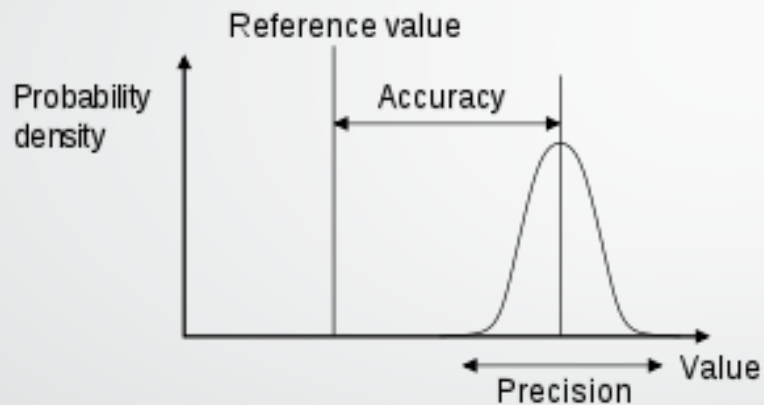
Results of Classification - intro

- **WEKA** classifiers:
 - **LMT** - logistic tree regressor
 - **J48** - decision tree classifier
 - Naïve Bayes classifier
 - **Zero-R** - simple majority baseline

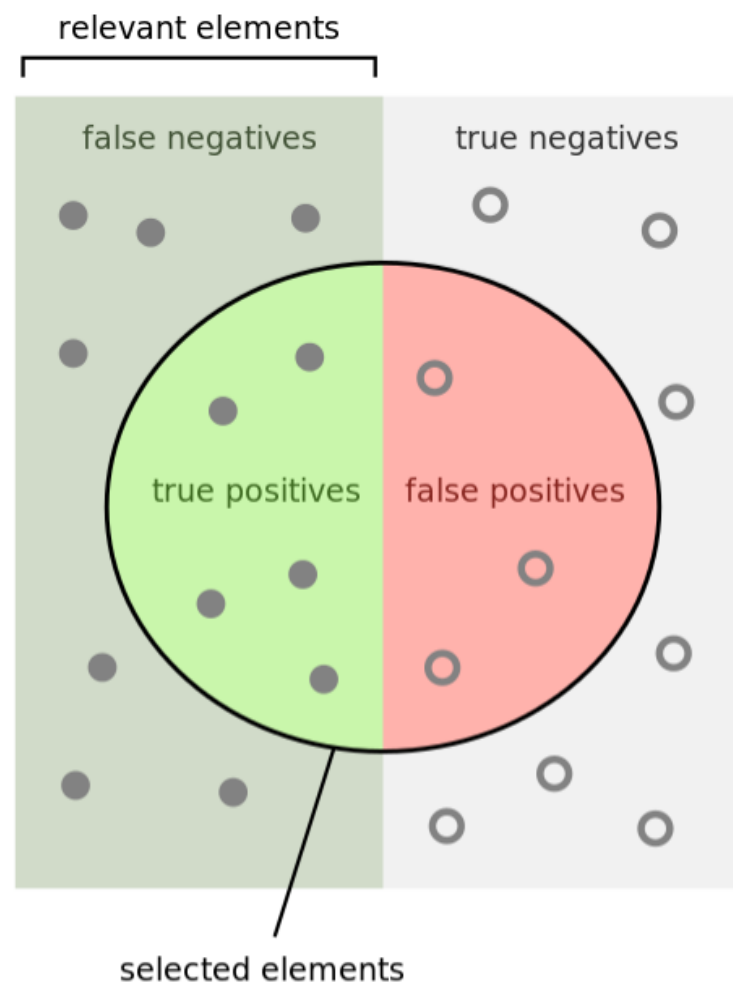


Statistics Terming

- Accuracy
- Precision
- Recall
- F-score



$$F = 2 \cdot \frac{\text{precision} \cdot \text{recall}}{\text{precision} + \text{recall}}$$



How many selected items are relevant?

$$\text{Precision} = \frac{\text{true positives}}{\text{true positives} + \text{false positives}}$$

How many relevant items are selected?

$$\text{Recall} = \frac{\text{true positives}}{\text{true positives} + \text{false negatives}}$$

Results of Classification

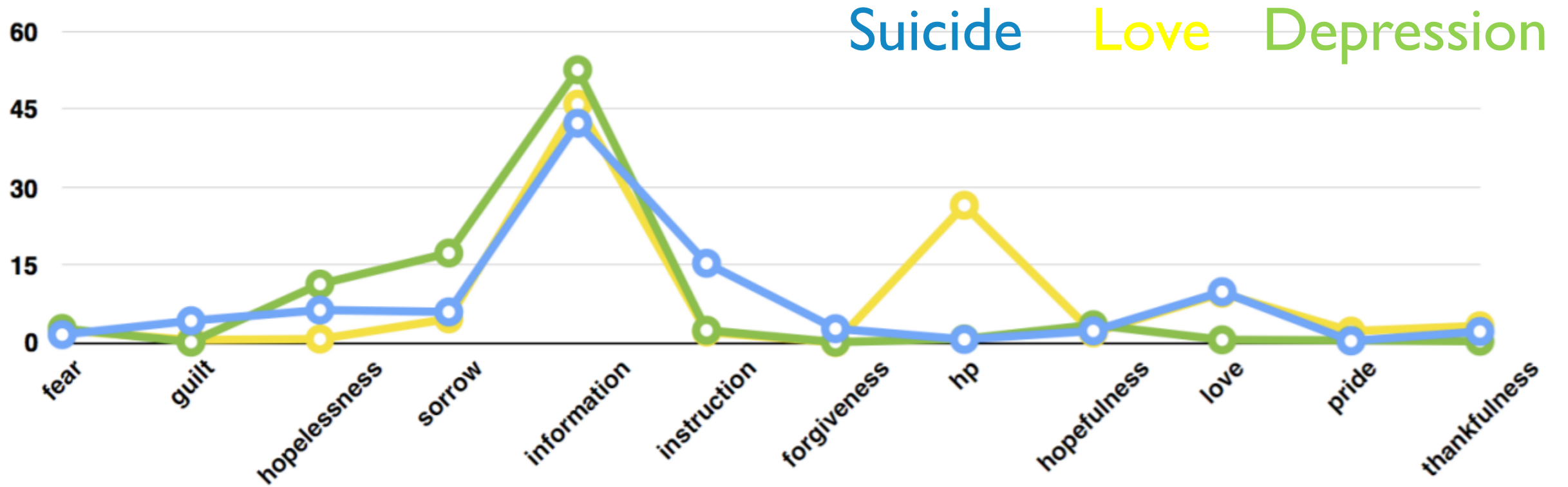
all features

sentiment features only

linguistic features only

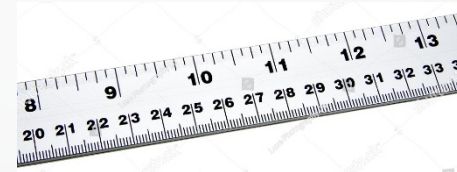
Classifier	ACC	PRE	REC	F-Score
LMT	86.61	0.86	0.86	0.86
J48	78.87	0.78	0.78	0.78
Naive Bayes	74.17	0.76	0.74	0.74
Zero-R	32.86	0.21	0.32	0.23
LMT	78.63	0.79	0.78	0.78
J48	71.36	0.71	0.71	0.71
Naive Bayes	69.01	0.72	0.69	0.68
Zero-R	32.86	0.21	0.32	0.23
LMT	75.35	0.75	0.75	0.75
J48	67.60	0.67	0.67	0.67
Naive Bayes	65.96	0.67	0.66	0.65
Zero-R	32.86	0.21	0.32	0.23

Discussion of Sentiment Features



Discussion of Linguistic Features

- Best predictors:
 - Length of a note
 - #of verbs and nouns
 - Endearment
 - Signs
 - Relativity



Dear , & ” > “and”









Oluwaseun Abiodun Awosanya



56 mins • 

26th of Dec Is Supposed my Birthday But It will Be My Last Day Please People if you Love or Loved me Take a one minute Stand for me in Black I will be Gone to the Place Of Rest May Our Dear Lord Jesus Christ Accept my Sinful Soul Till We meet Again.. Your Dearest

Oluwaseun Maria Omo Awosanya    



Conclusion and Future Works

- Important research direction
- Combination of **sentiment** and **linguistic** features
- Automatization of **sentiment analysis**
- Limitations:
 - language change affects
 - linguistic characteristic of online notes



Hi google! I'm not depressed. It's just case study about suicide.



Google

כלים

הגדרות

עוד

מפות

סרטונים

חדשות

תמונות

הכל

כ-18,300,000 תוצאות (0.71 שניות)

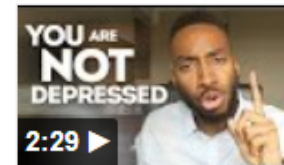
YOU ARE NOT DEPRESSED, STOP IT! - YouTube

תרגם דף זה <https://www.youtube.com/watch?v=ykvC3QXJb18>

21 ביוני 2016 - הועלה על-ידי Prince Ea

Sorry, but somebody had to say it. This video focuses on mood depression, not clinical depression ...

חסר: 2:29



For Those Considering Suicide - YouTube

תרגם דף זה <https://www.youtube.com/watch?v=lqqIv8x82Qc>

13 במאי 2013 - הועלה על-ידי watchwellcast

For more resources, please look here: <http://goo.gl/7xIUv> If your Friend is having thoughts of suicide, please ...

חסר: 4:31



Are You Thinking of Killing Yourself? | Speaking of Suicide : ...

<https://www.speakingofsuicide.com/2013/04/15/are-you-thinking-of-killing-yourself/>

They may feel, often rightly so, that their suicide will cause guilt in those feeling - 15 באפר' 2013
sorry for myself' or a better 1 is I'm just "looking for attention" well I I'm not depressed, I'm exhausted and the anxiety of my day to day life A google search for me would quickly turn up this post if I signed it with my name.



Questions?