Detection and Characterization of Stance on Social Media

Part 1
Detection and Characterization of Stance on Social Media

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Agenda

1. What is stance detection? [30 minutes] (Kareem Darwish)

-------- Break [15 minute] ------

2. Stance modeling in social media [interactive session] [120 minutes] (Abeer Aldayel / Kareem Darwish)

-------- Break [30 minute] ------

3. Stance detection applications and future trends? [60 minutes] (Walid Magdy)
Part 1

What is Stance Detection?

Kareem Darwish
@kareem2darwish
Who am I?

Arabic Language Technologies Team,
Qatar Computing Research Institute
What Do I Do?

• Farasa: Best Arabic NLP toolkit
• Stance detection
• Propaganda detection
What is Stance Detection?

• Ex. Gun control:
  • It passed! They dems are coming for our guns!
  • Nearly 40,000 Americans lose their lives each year because of gun violence we cant afford to make this a partisan issue

• Ex. Ilhan Omar:
  • No nuance necessary. Rep Ilhan Omar hates Jews period.
  • This just proves Ilhan’s point about the power of the Israel lobby #IStandWithIlhan
What is Stance Detection?

• Stance: is the position of the user towards an issue or entity.
• Stance detection: is the inference of stand or position towards an object of evaluation either being supporting or opposing.
• Examples:
  • Pro-life vs. Pro-choice
  • Democrat vs. Republican
  • #Tamam vs. #Devam (Turkish politics)
  • Sisawi (Sisi supporter) vs. pro-Arab Spring (Egypt)
  • Barcelona vs. Real Madrid (Ultras)
  • Android vs. iOS (fanboys)
What is Stance Detection?

• Stance could be based on:
  • One target: person, topic, etc.
  • Multiple targets:
    • Ex. Trump & Biden; Trump & Hillary Clinton
  • Claim: agreement/disagreement with a statement
    • Ex. hydroxychloroquine is effective
Why Stance Detection?

• Who supports (or opposes) target:
  • Demographics (age, gender, ethnicity, etc.), ideology, geography

• Motivation for stance:
  • History, ideology, psychology, etc.

• Correlations of stance:
  • Lifestyle choices, politics, identity, preferences

• Impact on society:
  • Polarization, elections
Why Stance Detection?

What is important for different groups over time?

2013 Coup in Egypt
## Why SD?

Association between politics & issues/life style choices.

<table>
<thead>
<tr>
<th>Series</th>
<th>Pro-Erdogan</th>
<th>Pro-Opposition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Siyah Beyaz Aşk (Black &amp; white love)</td>
<td>0.60%</td>
<td>99.40%</td>
</tr>
<tr>
<td>Vatanım Sensin (You are my country)</td>
<td>0.70%</td>
<td>99.30%</td>
</tr>
<tr>
<td>Söz (Promise)</td>
<td>3.80%</td>
<td>96.20%</td>
</tr>
<tr>
<td>Çukur (hole)</td>
<td>12.50%</td>
<td>87.50%</td>
</tr>
<tr>
<td>Diriliş Ertuğrul (Resurrection Ertugrul)</td>
<td>79.70%</td>
<td>20.30%</td>
</tr>
<tr>
<td>Payitaht Abdülhamid (Sultan Abdulhamid)</td>
<td>93.30%</td>
<td>6.70%</td>
</tr>
</tbody>
</table>
Why Stance Detection?

• Offering better recommendations:
  • Ideologically similar people have similar preferences!

• Triangulating views of people:
  • Helpful for marketing & polling
  • Disastrous if used by authoritarian regimes

• Sub-grouping population:
  • Discovering intersecting communities
  • Crafting tailored messages
Stance in Real Life vs. Social Media?

• Determining **stance** of people in **real life**:
  • Has many tools:
    • Polling, focus groups, surveys, participant observation, population sampling, population segmentation
  • Pro’s: Reasonably accurate, deep
  • Con’s: Expensive, affects participants
Stance in Real Life vs. Social Media?

• Determining stance on social media:
  • Has many tools:
    • Text, interactions, social network, sharing behavior, etc.
  • Pro’s: Cheap, quick, no effect on participant
  • Con’s: No estimates of real life representation, shallow, information overload
Stance in Real Life vs. Social Media?

• **Stance** is amplified on social media (compared to real life):
  • People can connect with similar others from around the globe
  • Social media algorithms promote homophily:
    • Recommend like minded people
    • Diminish the cost of separation
Stance Detection is NOT Sentiment Analysis?
**Stance Detection is NOT Sentiment Analysis?**

<table>
<thead>
<tr>
<th>Stance Detection</th>
<th>Sentiment Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Position towards target: Ex. pro-life vs. pro-choice</td>
<td>Polarity of text: Ex. “I am happy/sad”</td>
</tr>
<tr>
<td>Verbalized or non-verbalized: Ex. “RT @FoxNews: some news”</td>
<td>Verbalized – linguistic in nature Ex. “this is maddening!”</td>
</tr>
<tr>
<td>Target dependent: Ex. “I support XYZ”</td>
<td>Mostly Target independent Ex. “I am happy”.</td>
</tr>
<tr>
<td>Accuracy can be very high (75-98%)</td>
<td>Accuracy is mediocre (60-80%)</td>
</tr>
</tbody>
</table>
Stance Detection is NOT Sentiment Analysis?

I am sad that Hillary lost this presidential race

Ex. +ve stance/-ve sentiment:

I feel bad that he lost

Ex. –ve stance/+ve sentiment:

I am so glad that he bought the farm (died)
Stance does no correlate with *Sentiment* and *Offensiveness*!

**Climate Change**

- **Group A**: 99% Non-Offensive, 1% Offensive
- **Group B**: 99% Non-Offensive, 1% Offensive

**Police Brutality**

- **Group A**: 81% Offensive, 13% Non-Offensive, 6% Neutral
- **Group B**: 85% Offensive, 15% Non-Offensive

**Climate Change**

- **Group A**: 29% Positive, 42% Negative, 37% Neutral
- **Group B**: 34% Positive, 31% Negative, 34% Neutral

**Police Brutality**

- **Group A**: 81% Positive, 13% Negative, 6% Neutral
- **Group B**: 79% Positive, 7% Negative, 14% Neutral
Stance is Expressed in Many Ways

Next President, Joe Biden

Sleepy Joe you mean LOL!!!
Stance is Expressed in Many Ways

• Climate change: #ClimateAction vs. #ClimateGate
• Police brutality: #BlackLivesMatter vs. #BlueLivesMatter
• Elections: #VoteBlue vs. #RedWave
Stance is Expressed in Many Ways

- User 1: RT @FoxNews, @TrumpWarRoom, @BreitbartNews, @Mike_Pence
- User 2: RT @JoeBiden, @MSNBC, @WashingtonPost, @KamalaHarris, @MoveOn
Stance is Correlated Across Topics
Types of Stance Detection?

• **Text stance detection**: What is the stance in a “text snippet”?  
  • Ex. tweet: “#SleepyJoe you mean LOL!!”
  • Pro’s:
    • Fine grained
  • Con’s:
    • Stance is often implicit & difficult
      • Ex. “US faces PPE shortage” (blame); “Economy is tanking” (blame); “Nov. elections most important in a generation” (call for action)
    • Ignores context!
    • Results are suboptimal
Types of Stance Detection?

- **User stance detection**: What is the stance of a person/user?
  - Ex. tweet: “RT @MSNBC: 66% disapprove of Pres. Trump's handling ... new ABC News/Ipsos poll”
  - Pro’s:
    - Uses lots of context
    - Potentially very accurate
  - Con’s:
    - Coarse grained
    - Based on strong assumptions
Types of Stance Detection?

• Stance prediction: What might be the stance of a person/user?
  • Ex. user hasn’t said anything
  • Pro’s:
    • Wicked!
  • Con’s:
    • We are never sure
    • Dangerous in the wrong hands
Social Psychology Informs Stance Detection

Homophily

Social Influence/pressure
Echo chambers: closed communities share socially confirming content from similar sources
Social Psychology Informs Stance

*User with similar stances:*

- Retweet the same accounts
- Listen the same media
- Use similar hashtags
- Share similar items
- Use similar expressions
- Have similar preferences
- May live next to each other
Up Next

• How do we do stance detection – Abeer & Kareem
• Applications of stance detection -- Walid
End of Part 1
Thank you