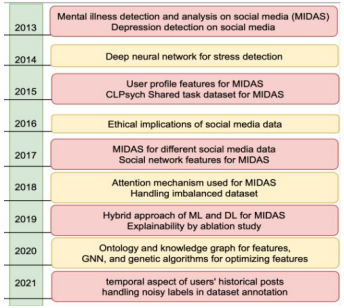
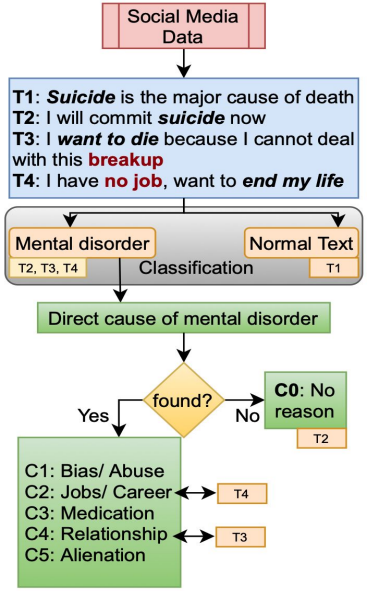
# CAMS: An annotated Corpus for Causal Analysis of Mental Health Issues in Social Media Posts

Muskan Garg, Chandni Saxena, Veena Krishnan, Ruchi Joshi, Sriparna Saha, Vijay Mago, Bonnie J Dorr.

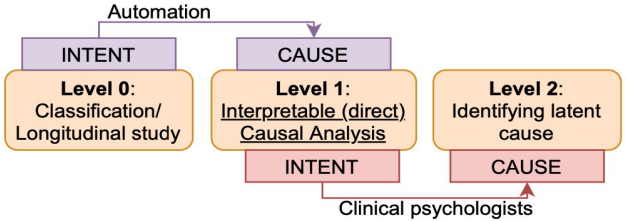
## EVOLUTION OF STUDIES




## TASK DEFINITION




## FRAMEWORK




## DATASET & ANNOTATIONS

| Cause | CC | Train_S | Test_S | CAMS |
|---|---|---|---|---|
| No reason | 292 | 332 | 70 | 694 |
| Bias or abuse | 122 | 194 | 35 | 351 |
| Jobs/careers | 399 | 181 | 48 | 628 |
| Medication | 410 | 170 | 43 | 623 |
| Relationship | 956 | 297 | 91 | 1344 |
| Alienation | 976 | 340 | 92 | 1408 |
| **Total** | **3155** | **1517** | **379** | **5051** |

Fliess' Kappa inter-observer agreement coefficient:
**CC - 64.23%, Train_S - 60.23%, Test_S - 73.42%**
Agreement rate for annotators: **61.28%**

## ANNOTATIONS PERPLEXITY

1. Multiple reasons in post, i.e., more than one reason in the conveyed feelings: **Solution:** *Root cause.*
2. Ambiguity in human interpretations due to subjective nature of causal analysis. **Final category:** *Majority rules.*
3. Subject of intent in the post: Many posts refer to the depression of loved ones and other acquaintances.

**Solution:** *Consider self-reported instances only.*

| Dataset | Task | Avail. |
|---|---|---|
| **CLPsych** (Coppersmith et al., 2015) | Depression detection for suicide risk | S |
| **MDDL** (Shen et al., 2017) | Depression candidate detection (D1, D2, D3) | A |
| **RSDD** (Yates et al., 2017) | Depression detection from Reddit data | ASA |
| **SMHD** (Cohan et al., 2018) | Multi-task mental illness from Reddit data | ASA |
| **eRISK** (Losada et al., 2018) | Early risk detection: CLEF | A |
| **Pirina18** (Pirina and Çöltekin, 2018) | Depression detection from Reddit data | A |
| **Ji18** (Ji et al., 2018) | Suicide risk detection from Reddit data | AR |
| **Aladag18** (Aladağ et al., 2018) | Suicide risk detection | AR |
| **Sina Weibo** (Cao et al., 2019) | Identifying candidates with suicide risk | AR |
| **SRAR** (Gaur et al., 2019) | Suicide risk from Reddit posts | ASA |
| **Dreaddit** (Turcan and McKeown, 2019) | Stress detection from Reddit posts | A |
| **UMD-RD** (Shing et al., 2020) | Suicide risk detection from Reddit data | ASA |
| **SDCNL** (Haque et al., 2021) | Suicide v/s depression from Reddit | A |
| **CAMS** (Ours) | Interpretable Causal analysis from Reddit | A |

## EXPERIMENTS AND RESULTS

| Classifier | F1: C0 | F1: C1 | F1: C2 | F1: C3 | F1: C4 | F1: C5 | Accuracy |
|---|---|---|---|---|---|---|---|
| LR | **0.63** | **0.28** | 0.54 | **0.46** | 0.46 | **0.53** | **0.5013** |
| SVM | 0.54 | 0.23 | **0.56** | 0.44 | **0.48** | 0.45 | 0.4670 |
| LSTM | 0.54 | **0.27** | 0.52 | 0.46 | 0.42 | **0.51** | 0.4595 |
| CNN | 0.56 | **0.27** | 0.51 | 0.42 | 0.46 | 0.38 | 0.4378 |
| GRU | 0.51 | **0.27** | 0.54 | **0.47** | 0.48 | 0.42 | 0.4541 |
| Bi-LSTM | 0.55 | 0.12 | 0.41 | 0.23 | 0.44 | 0.50 | 0.4351 |
| Bi-GRU | **0.57** | 0.14 | **0.55** | 0.46 | 0.49 | 0.39 | 0.4568 |
| CNN+GRU | 0.51 | 0.14 | 0.49 | 0.36 | 0.27 | 0.45 | 0.4027 |
| CNN+LSTM | 0.54 | 0.22 | 0.54 | **0.47** | **0.54** | 0.47 | **0.4778** |

## LIMITATIONS & CONCLUSIONS

Introduced CAMS dataset with 5051 instances in the format of <Text (String), Causal category (Integer), Interpretation (String)>
DISCOURSES AND PRAGMATICS

## ACKNOWLEDGEMENTS

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