

Predicting Hateful Discussions on Reddit using Graph Transformer Networks and Communal Context

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Abstract—We propose a system to predict harmful discussions on social media platforms. Our solution uses contextual deep language models and proposes the novel idea of integrating state-of-the-art Graph Transformer Networks to analyze all conversations that follow an initial post. This framework also supports adapting to future comments as the conversation unfolds. In addition, we study whether a community-specific analysis of hate speech leads to more effective detection of hateful discussions. We evaluate our approach on 333,487 Reddit discussions from various communities. We find that community-specific modeling improves performance two-fold and that models which capture wider-discussion context improve accuracy by 28% (35% for the most hateful content) compared to limited context models.

Index Terms—Hate Speech, Social Media and Social Discourse, AI for Social Good, Graph Neural Networks, Natural Language Processing

I. INTRODUCTION

The rise of social media has led to increased harmful discourse with damaging mental health effects. A recent study by Gao et al. measured the mental health of over 4800 Chinese citizens and found a high correlation between increased anxiety and depression with high social media usage [1]. These alarming trends have motivated the usage of automated detection methods to help moderate these platforms and prevent further harms.

A common approach of methods that tackle this problem is to detect the harmfulness of individual comments that belong to a wider discussion [2]–[4]. Two central challenges arise, however. First, conversational hate speech is deeply contextual. To properly understand if a comment is hateful, it is important to understand the context in which it was said. Second, by only analyzing the harmfulness of individual comments, we are bound to a reactive kind of moderation, which requires the damaging comment and the discussion that led to it be published first. This can lead to the spread of conversations that discuss harmful or sensitive subjects which can incite further hateful discourse. As such, it is important to proactively detect the tone and trend of conversations before they can delve into explicit hate speech.

Towards the goal of proactive detection, we also believe that it is important to consider the unique latent communal norms

and behaviours that underpin social groups. Content which may trigger a hateful reaction from members of one group can trigger a different reaction from another group. This focus is inspired by a recent study by Cisellie et al., which found that online communities are prone to the “echo chamber” effect, where extreme ideals can be encouraged and amplified [5]. As such, learning these cultural norms and behaviours is essential to properly model the direction of a conversation and whether that direction leads to hate speech.

Taking all these observations into consideration, the question is how to design a framework that can perform a rich analysis of branching social media discussions with a view of proactive hate speech prediction, and also how best to design experiments to demonstrate whether community-specific analysis provides important benefits.

To study the behaviours of diverse communities, we focus on the social platform Reddit, where discussions take place in topic-orientated communities called subreddits. These communities are highly varied, ranging from *aww*, to discuss cute animals, and *politics*, to discuss political affairs. Beyond their subject differences, prior work by Waller et al. found that these communities exhibit significant differences in their social makeup and discussion behaviours [6]. For example, discussions that take place on *The_Donald* were found to have a significant political right leaning bias whereas *politics* has an opposing left leaning bias. Within these communities, conversations take place in branching trees structures where any user can reply to the comments of other users, forming a linked chain of replies that can branch off into sub-discussions. In addition to textual replies, users can explicitly provide their opinion by up-voting (approving) or down-voting (disapproving) the comments of other users.

The need for a deeper analysis of discussions with critical consideration of the relevant context becomes apparent when examining the excerpt from Reddit provided in Figure 1. Focusing on the first interaction is insufficient in properly detecting the tendency towards hate, as these initial comments are actually quite benign. Indeed, what is perhaps most troubling with this excerpt is the kind of snowball effect of anti-social sentiment, as the discussion progresses.

Framework Reddit Discussions

Tao Wei



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Frontiers in Fake Media Generation and Detection Mahdi Khosravy, Isao Echizen, Noboru Babaguchi, 2022-05-28 The book presents recent advances in the generation and detection of fake multimedia It also presents some frontiers in defensive techniques in front of skillfully cloned media The ultimate purpose of the research direction presented by this book is to build up a trustworthy media network benefited by an iron dome in front of media clones attacks The book focusses on 1 applications of deep generative models in the generation of fake multimedia and 2 cyber defensive and detective techniques in front of cyberattacks The book is composed of three parts i introduction ii fake media generation and iii fake media detection

AI Collaboration and Mastery: Guiding Frameworks Ronald Joseph Legarski, Jr., Grok, 2025-04-26 AI Collaboration and Mastery Guiding Frameworks is your practical and inspiring guide to building sustainable impactful businesses in the AI powered era Whether you re launching your first side hustle growing a freelance agency or scaling an entrepreneurial dream this book reveals how to partner with AI not compete against it to automate monetize and amplify your vision Co authored by Ronald Legarski and informed by real world success stories like Emma s 2 000 month eBook venture and Sofia s thriving Etsy shop this book offers actionable roadmaps for Using tools like ChatGPT Canva and Zapier to create market and automate Monetizing through platforms like KDP Etsy Fiverr and Shopify Scaling your ventures ethically and sustainably through AI collaboration Building legacies that harmonize profit purpose and community impact Rooted in the Peacenomic vision a philosophy of interconnected systems and harmonious growth AI Collaboration and Mastery blends technological mastery with human creativity It invites you to orchestrate a Cosmicaloginomosymphony of tools trends and community wisdom to achieve long term success You don t need a tech degree you need curiosity creativity and the right frameworks This book gives you all three

Complex Networks and Their Applications XI Hocine Cherifi, Rosario Nunzio Mantegna, Luis M. Rocha, Chantal Cherifi, Salvatore Micciché, 2023-01-03 This book highlights cutting edge research in the field of network science offering scientists researchers students and practitioners a unique update on the latest advances in theory and a multitude of applications It presents the peer reviewed proceedings of the XI International Conference on Complex Networks and their Applications COMPLEX NETWORKS 2022 The carefully selected papers cover a wide range of theoretical topics such as network models and measures community structure network dynamics diffusion epidemics and spreading processes resilience and control as well as all the main network applications including social and political networks networks in finance and economics biological and neuroscience networks and technological networks

Discovery Science Dino Pedreschi, Anna Monreale, Riccardo Guidotti, Roberto Pellungrini, Francesca Naretto, 2025-01-27 The two volume set LNAI 15243 15244 constitutes the proceedings of the 27th International Conference on Discovery Science DS 2024 which took place in Pisa Italy during October 14 16 2024 The 53 full papers presented in the proceedings were carefully reviewed and selected from 121 submissions They were organized in topical sections as follows Part I LLM

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Disengagement Adi Kuntsman,Sam Martin,Esperanza Miyake,2023-07-14 How can we achieve digital justice in the age of COVID 19 This book explores how the pandemic has transformed our use and perception of digital technologies in various settings It also examines the right to resist or reject these technologies and the politics of refusal in different contexts and scenarios The book offers a timely and original analysis of the new realities and challenges of digital technologies paving the way for a post COVID 19 future **Youth Digital Health and Online Platforms** Martyna Gliniecka,2024-12-27 Youth

Digital Health and Online Platforms focuses on young people s use of the digital platform Reddit for health Drawing upon dialogism theory the book explores how young people produce a youth led discourse of youth digital health different from the adult led framing represented in youth digital health research policy and service delivery Peer led discussions online remain one of the controversial forms of youth digital health associated with negative peer influence or casual teenage talk This book argues that online peer led dialogues support young people s agency in health and that young people can benefit from dealing with health issues with peers The work is based on the digital ethnography of teenagers subreddits on Reddit and utilises a theoretical framework of dialogism a linguistic based theory originated by an early 20th century Russian philosopher Mikhail Bakhtin The book introduces the concept of dialogical youth led youth digital health discourse formed in the peer led space of Reddit This youth led discourse celebrates equality and diversity amongst people meanings and opinions It is constructed around three relational elements socio material affordances creative practices and a plurality of youth voices Reddit s pseudonymous anti authoritarian and egalitarian nature supports the emergence of this youth led discourse The book can interest scholars and lecturers in childhood and youth studies Internet studies and youth health studies Professionals such as policymakers service designers deliverers online safety educators and global youth and health agencies can use evidence based insights in their work with young people **Scalable Uncertainty Management** Nahla

Ben Amor,Benjamin Quost,Martin Theobald,2019-12-02 This book constitutes the refereed proceedings of the 13th International Conference on Scalable Uncertainty Management SUM 2019 which was held in Compi gne France in December 2019 The 25 full 4 short 4 tutorial 2 invited keynote papers presented in this volume were carefully reviewed and selected from 44 submissions The conference is dedicated to the management of large amounts of complex uncertain incomplete or inconsistent information New approaches have been developed on imprecise probabilities fuzzy set theory rough set theory ordinal uncertainty representations or even purely qualitative models **From Text to Understanding** Miloš

Švaňa,František Zapletal,Miroslav Hudec,2025-09-26 Social media and other sources of text data are still underutilized

resources in public decision making Most public organizations and governmental bodies rely mainly only surveys interviews and other traditional methods for gathering opinions One issues is a lack of easy to use tools for mass text data processing that would enable these organizations to process and understand this type of data This book introduces a novel text data analysis framework designed for public decision making specifically on the level of municipalities The framework combines sentiment analysis with topic modelling and a fuzzy based approach for capturing the diversity in sentiment arising from the fact that different people have different opinions on a given topic The book is recommended for practitioners in public decision making as well as researchers analyzing large amounts of text data in order to understand people s opinions

Experimental IR Meets Multilinguality, Multimodality, and Interaction Fabio Crestani, Martin Braschler, Jacques Savoy, Andreas Rauber, Henning Müller, David E. Losada, Gundula Heinatz Bürki, Linda Cappellato, Nicola Ferro, 2019-09-02 This book constitutes the refereed proceedings of the 10th International Conference of the CLEF Association CLEF 2019 held in Lugano Switzerland in September 2019 The conference has a clear focus on experimental information retrieval with special attention to the challenges of multimodality multilinguality and interactive search ranging from unstructured to semi structures and structured data The 7 full papers and 8 short papers presented in this volume were carefully reviewed and selected from 30 submissions This year many contributions tackle the social networks with the detection of stances or early identification of depression signs on Twitter in a cross lingual context Further this volume presents 7 best of the labs papers which were reviewed as a full paper submission with the same review criteria The labs represented scientific challenges based on new data sets and real world problems in multimodal and multilingual information access In addition to this 9 benchmarking labs reported results of their yearlong activities in overview talks and lab sessions

Harnessing AI, Machine Learning, and IoT for Intelligent Business Allam Hamdan, Udo Braendle, 2024-10-15 This book addresses the growing need for understanding the practical implications of these technologies in the context of financial management The convergence of AI ML and IoT has revolutionized various industries and business management and finance are no exceptions This book equips both academics and industry professionals with the knowledge and tools necessary to navigate the changing landscape and effectively harness these technologies to gain a competitive edge Intelligent Business is a comprehensive guide that explores the integration of artificial intelligence AI machine learning ML and the Internet of Things IoT in the realm of business management and finance This book delves into the transformative potential of these technologies and provides valuable insights into their application in decision making risk management financial analysis and strategic planning It offers a holistic perspective on how organizations can leverage AI ML and IoT to drive innovation enhance operational efficiency and achieve sustainable growth in the digital age

Unveiling the Power of Verbal Beauty: An Emotional Sojourn through **Framework Reddit Discussions**

In a world inundated with monitors and the cacophony of instantaneous interaction, the profound power and emotional resonance of verbal beauty frequently diminish into obscurity, eclipsed by the continuous onslaught of noise and distractions. However, set within the musical pages of **Framework Reddit Discussions**, a interesting perform of fictional beauty that impulses with natural feelings, lies an unforgettable journey waiting to be embarked upon. Published by a virtuoso wordsmith, this exciting opus instructions viewers on a mental odyssey, softly revealing the latent potential and profound impact stuck within the complex internet of language. Within the heart-wrenching expanse of this evocative evaluation, we shall embark upon an introspective exploration of the book is key styles, dissect its captivating writing type, and immerse ourselves in the indelible effect it leaves upon the depths of readers souls.

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