

Same Author or Just Same Topic?

Towards Content-Independent Style Representations

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Utrecht
University

Style in Natural Language Processing

Style is an integral
part of language

- influences perception

e.g., [El Baff et al., Analyzing the Effect of Style in News Editorial Argumentation, 2020]

- relevant for NLU & NLG

e.g., [Danescu-Niculescu-Mizil et al., Chameleons in Imagined Conversations: A New Approach to Understanding Coordination of Linguistic Style in Dialogs, 2011], [Ficler and Goldberg, Controlling Linguistic Style Aspects in Neural Language Generation, 2017]

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Computational representations
focus on semantics & syntax

Learning Style Representations

Authorship Verification (AV)

as training task:

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as training task:

True. Some of them
are religious nutbars._

Lol all i can say is got-
tem. you got wrecked
by a class A douchebag

I mean Judaism and
Sikhi also believe that._

Label:  Same Author

Learning Style Representations

Authorship Verification (AV)

+ extensive training

e.g., [Zhu et al., Idiosyncratic but not arbitrary: Learning idiolects in online registers reveals distinctive yet consistent individual styles., 2021]



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Domain:  r/OkCupid  r/DebateReligion

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⚡ content \propto style


e.g., [Sundararajan et al., What represents “style” in authorship attribution?, 2018; Sari et al., Topic or style? Exploring the most useful features for authorship attribution., 2018]



as training task:

True. Some of them
are **religious** nut-
bars.

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I mean **Judaism** and
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Label:  Same Author

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Learning with Content Control

Authorship Verification (AV)

as training task:

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Authorship Verification (AV)

as training task:

don't suggest an open relationship if you're not ready

Aren't open relationships usually just about fixing something in the relationship?

it's clear that these are wildly different situations

Src: ■ conversation C_1 ■ conversation C_2

Learning with Content Control

Authorship Verification (AV)

- using **conversation** as content control
- using **contrastive** setup
→ see paper

as training task:

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Evaluation

1. Authorship Verification

Are same author sentences close to each other independent from topic?

2. Content Independence

Are known style dimensions (e.g., formal vs. informal) preferred over content information?

Selected Results — Authorship Verification

**Comparable AV scores
with content control**

Training Task	AV (AUC)
RoBERTa base	0.53
No Content Control	0.58
Domain (Slide 3)	0.68
Conversation (Slide 4)	0.69

Content Independence - STEL-Or-Content Task

r u a fan of them
or something?

Are you one of their
fans?

Oh yea and that young
dr got bad hair



Same Style



Paraphrase

based on [Wegmann and Nguyen, Does it capture STEL?, 2021]

Selected Results — Content Independence

**Conversation
content control
leads to highest
content
independence**

Training Task	STEL- Or-Content Task (ACC)
RoBERTa base	.05
No Content Control	.24
Domain (Slide 3)	.32
Conversation (Slide 4)	.42

Summary

- ▶ Style representation learning usually does not control for content
- ▶ We control for content on conversations
- ▶ resulting in more content-independent representations

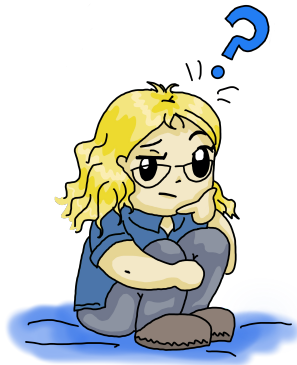
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Future Work

- ▶ what do representations encode?
- ▶ potential to increase classification performances for diverse demographics & social groups

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More questions or comments? Want to learn more or get to know each other? ...



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Data & Code: github.com/nlpsoc/style-embeddings