

The background of the image is a dense, chaotic collage of torn newspaper clippings. The paper is light beige and shows various fragments of text, including headlines like "It's a clown", "an accident", and "a stress signal". The text is in various fonts and sizes, some bold and some regular, creating a textured, layered effect. The central text is superimposed on this background.

# Sistem preporuke novinskih članaka

a.k.a *bubbleformer*

# Sadržaj

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# Cilj

- Implementacija mreže koja za svakog korisnika predviđa da li je neka vest dobra za tog korisnika
- Rekonstrukcija rezultata sa rada

**Neural News Recommendation with Multi-Head Self-Attention (NRMS)**

# Skup podataka

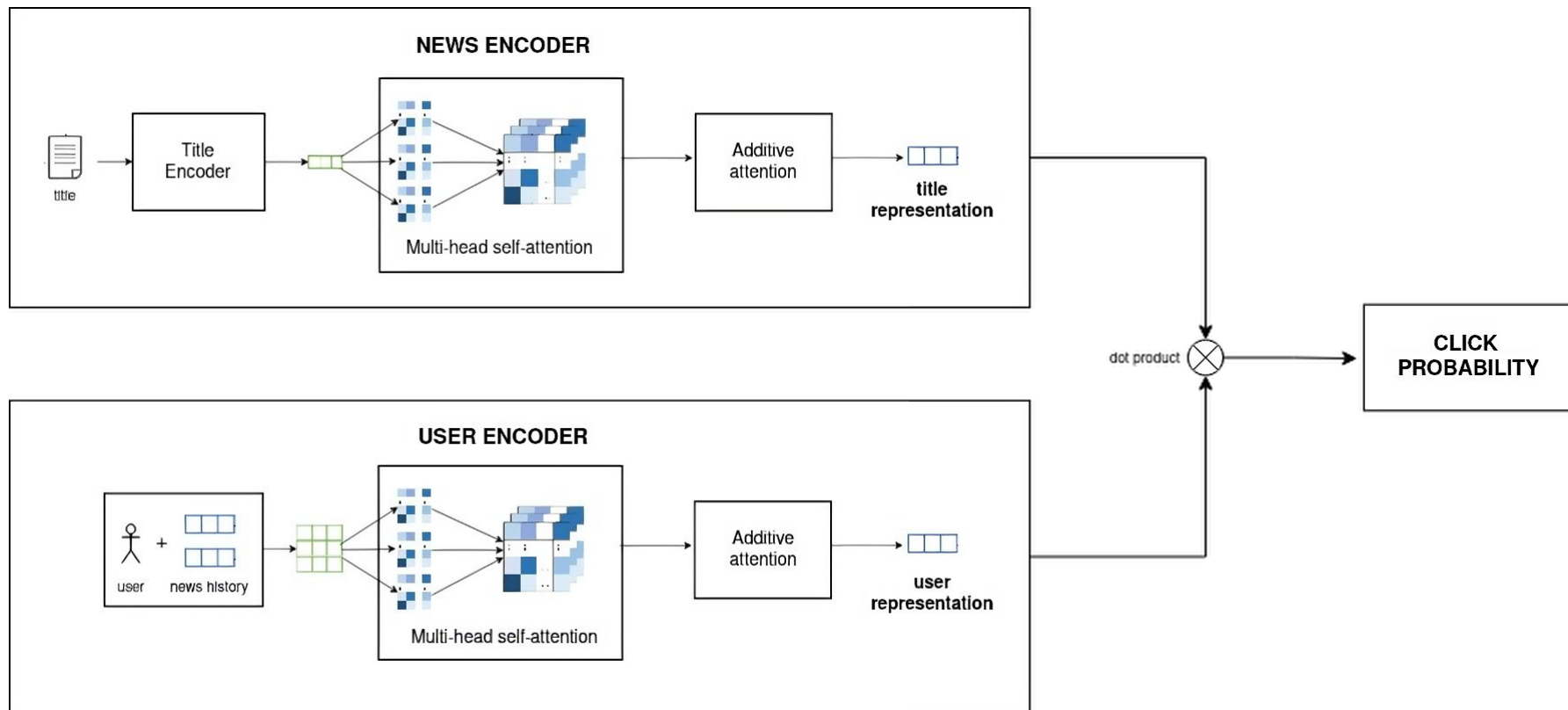
## MIND: Microsoft News Dataset

- 50k novinskih članaka (**naslov**, abstrakt, kategorija, url...)
- 50k hiljada korisnika
- 150k hiljada klik logova (**istorija klikova**, **predloženi članci sa informacijom o kliku**, vremenski trenutak informacija)

Podaci su prikupljani u toku 6 sedmica, oktobar i novembar 2019.

- prve 4 nedelje - kreiranje istorije odabranih članaka
- 5. nedelja, prvih 6 dana - **trening** skup
- 5. nedelja, poslednji dan - **validacioni** skup
- 6. nedelja - **test** skup

# Arhitektura



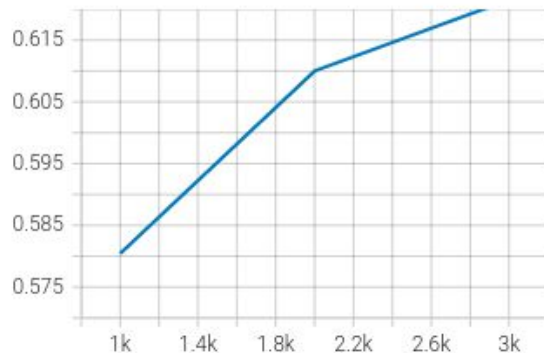
# Metrike

- Area under curve (**AUC**)
- Mean Reciprocal Rank (**MRR**)
- Normalized Discounted Cumulative Gain (**nDCG@k**)

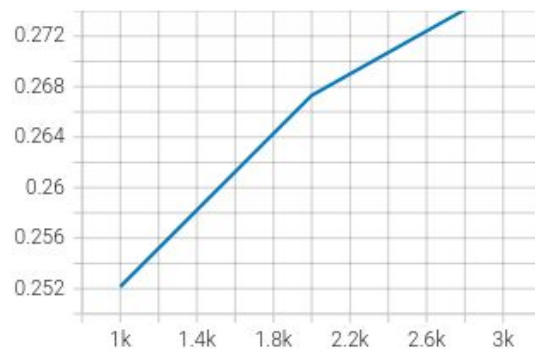
# Rezultati i evaluacija

**AUC**  
0.6448  
(0.6275)

AUC  
tag: Validation/AUC



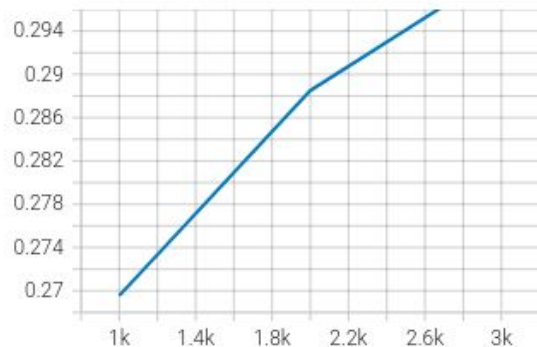
MRR  
tag: Validation/MRR



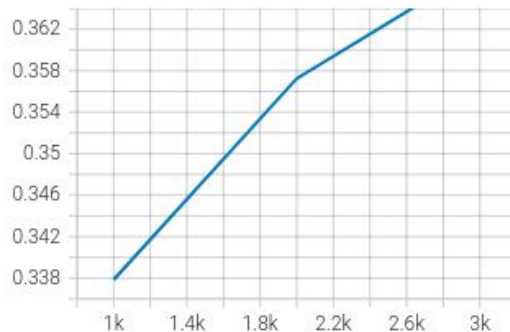
**MRR**  
0.2975  
(0.2985)

**nDCG@5**  
0.3247  
(0.3217)

nDCG@5  
tag: Validation/nDCG@5



nDCG@10  
tag: Validation/nDCG@10



**nDCG@10**  
0.3909  
(0.4139)

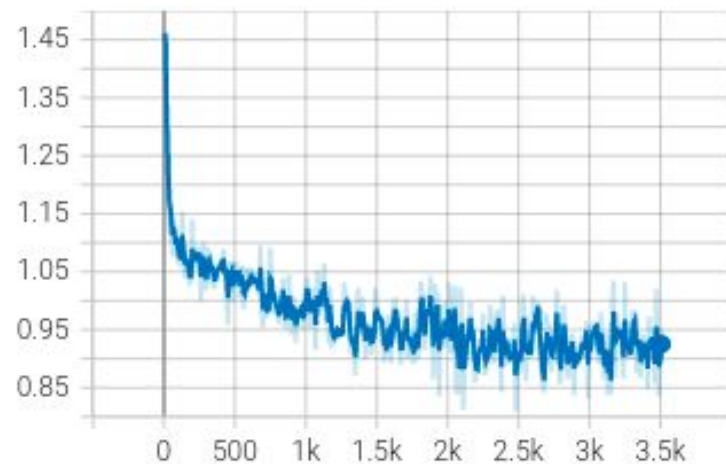
# Funkcija troška

$$p_i = \frac{\exp(\hat{y}_i^+)}{\exp(\hat{y}_i^+) + \sum_{j=1}^K \exp(\hat{y}_{i,j}^-)}.$$

$$\mathcal{L} = - \sum_{i \in \mathcal{S}} \log(p_i).$$

Train/Loss

tag: Train/Loss





# Primjeri

**Istorija** nasumično izabranog korisnika:

- Former **Trump** advisor John Bolton...
- **Diplomats: Iran** briefly held IAEA ...
- **Trump's** advisers gave him opti ...
- Elton John has not seen "Bohemian..
- Anonymous **Trump** official writing ...
- Man accused in probe of Guiliani ...
- CNN Poll: **Biden's** lead in Democra ...
- Celebs turning 60 in 2019
- **Iran** downs drone over southern ...
- **Iran** nuclear crisis escalates

**Preporuke** za tog korisnika:

- McConnell: Impeachment measure ...
- **Trump** says jihadist leader died ...
- Ocasio-Cortez grills Facebook's Zuc ..
- Elijah Cummings farewell: **Obama**, ...
- Pelosi holds off vote to **Trump** imp ...
- House **Democrat** criticizes Missisipi ...
- On impeachment strategy, **Pelosi** ...
- Kevin Durant: Draymond Green Fig ...
- What **Trump** has said about Ukraine
- Jordan: **Republicans** Will Subpoena...

# Zaključak

- Uspešno replicirani rezultati sa rada
- Treba dosta vremena da se cela mreža implementira od nule

## Dalje istraživanje:

- Dodavanje pozicionog enkodera za naslov i istoriju klikova
- Samplovanje vesti sa kontekstom, ne random
- Detaljnije upoznavanje sa drugim mrežama koje daju bolje rezultate

# Reference

Wu, C., Wu, F., Ge, S., Qi, T., Huang, Y., & Xie, X. (2019).  
**Neural News Recommendation with Multi-Head Self-Attention**

Wu et al.(2020)

**MIND: A Large-scale Dataset for News Recommendation**

referentni kod: <https://github.com/yusanshi/news-recommendation>

The background of the image consists of a collage of crumpled newspaper pages, with some text like "an acci" and "ST 09" visible. Scattered across the white central area are approximately 15 yellow robot icons. Each robot has a single large eye, a small orange graduation cap on its head, and three small legs at the bottom.

# Hvala na pažnji !

**Tanja Miković, ETF Beograd**  
**Milica Sladaković, FTN Novi Sad**