

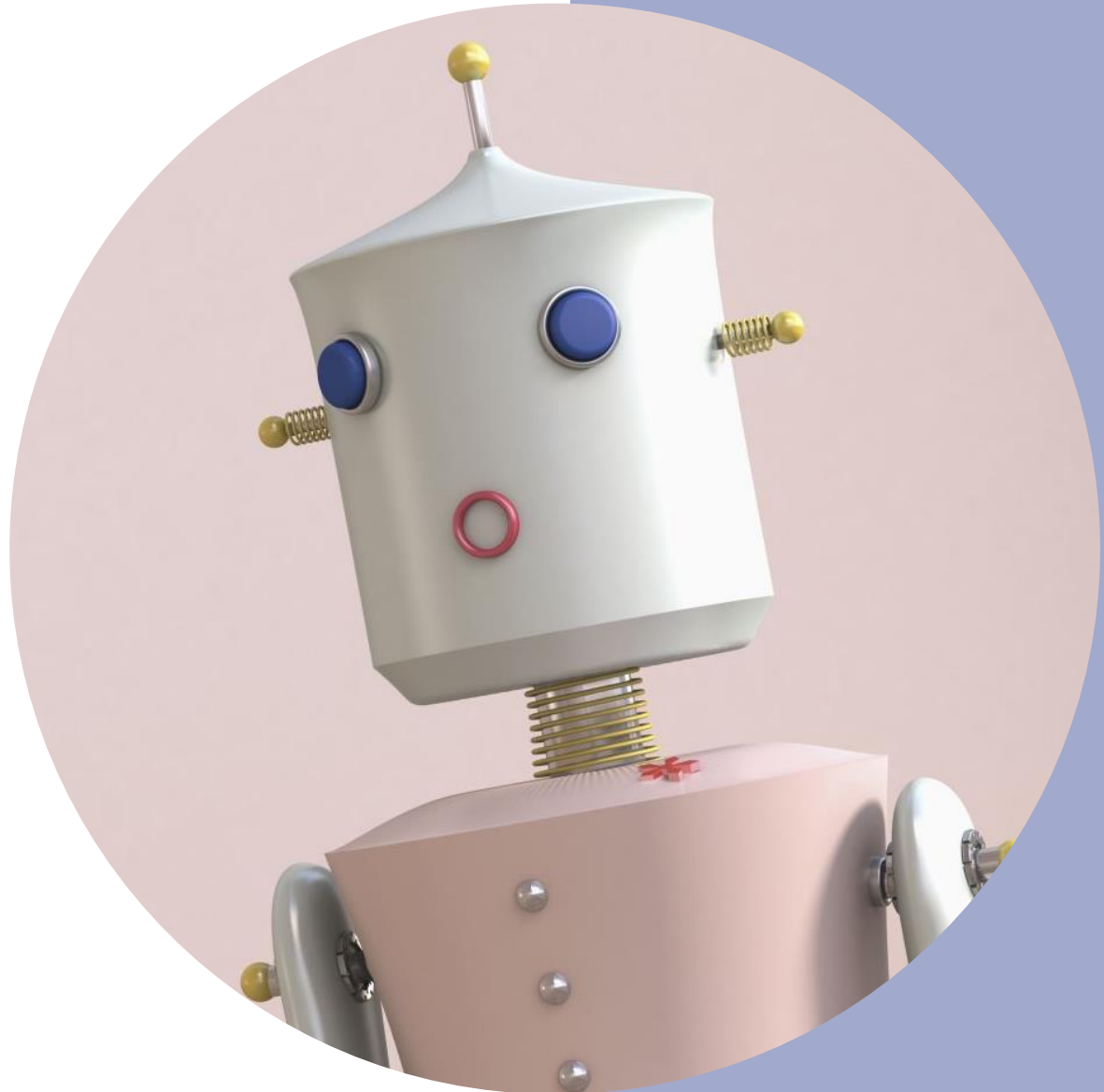
# HOA

The chatbot made to help you  
with Mental Health Issues

Sarah Busson

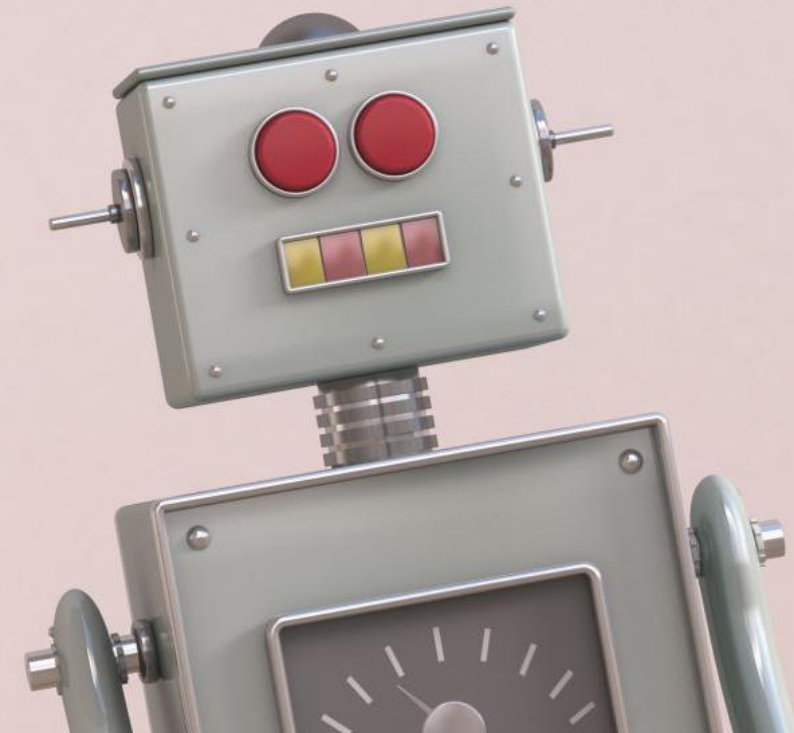
Ironhack Amsterdam

Data Analytics – Cohort 07/20



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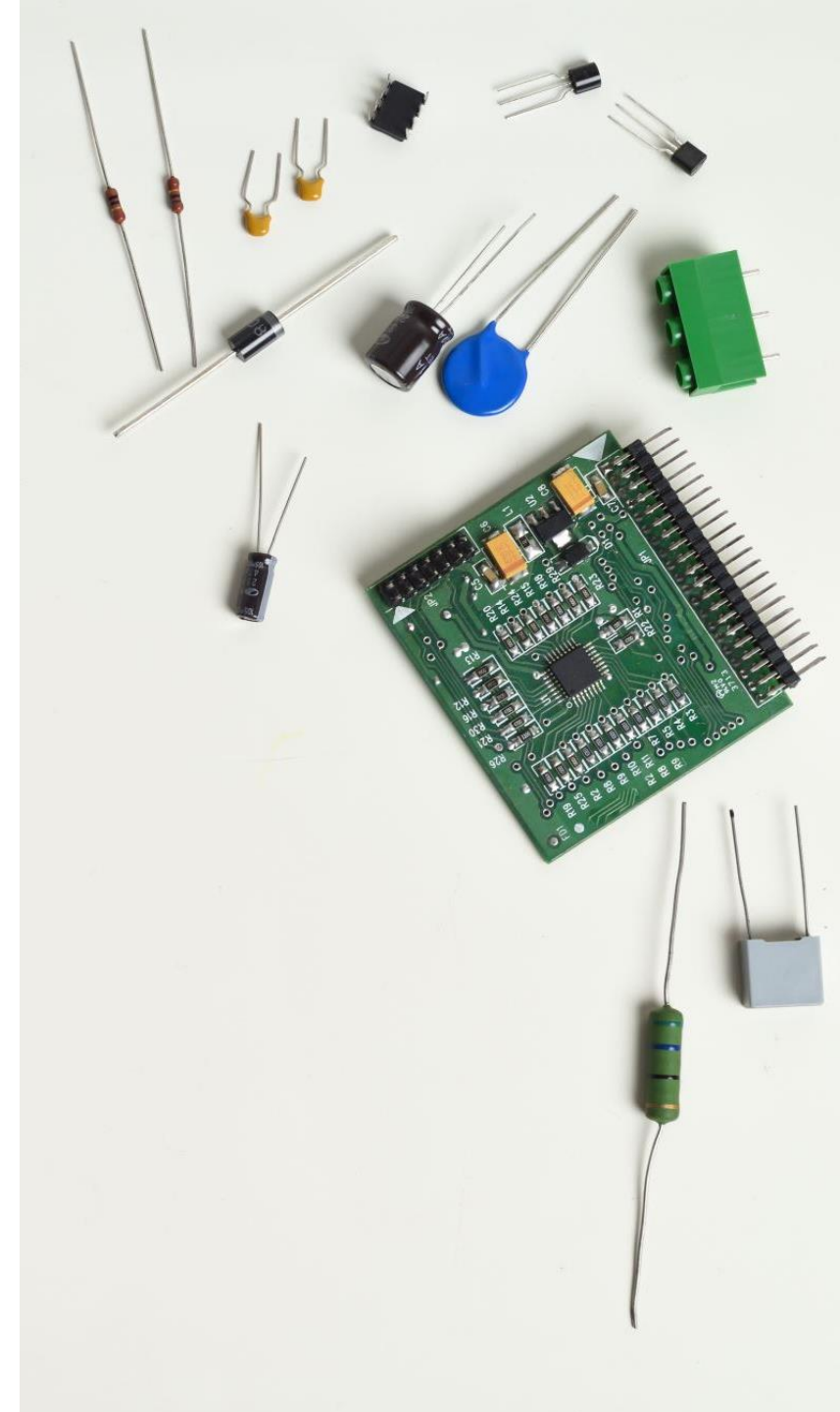
# Mental Health

- Psychological well-being
  - Affect how we feel, think and act
  - Change mood and behaviour
  - Brain factors and/or life experiences
- 1 out of 8 people is facing mental disorder
- 1 suicide every 40 seconds
- Disorders remain poorly understood by ourselves



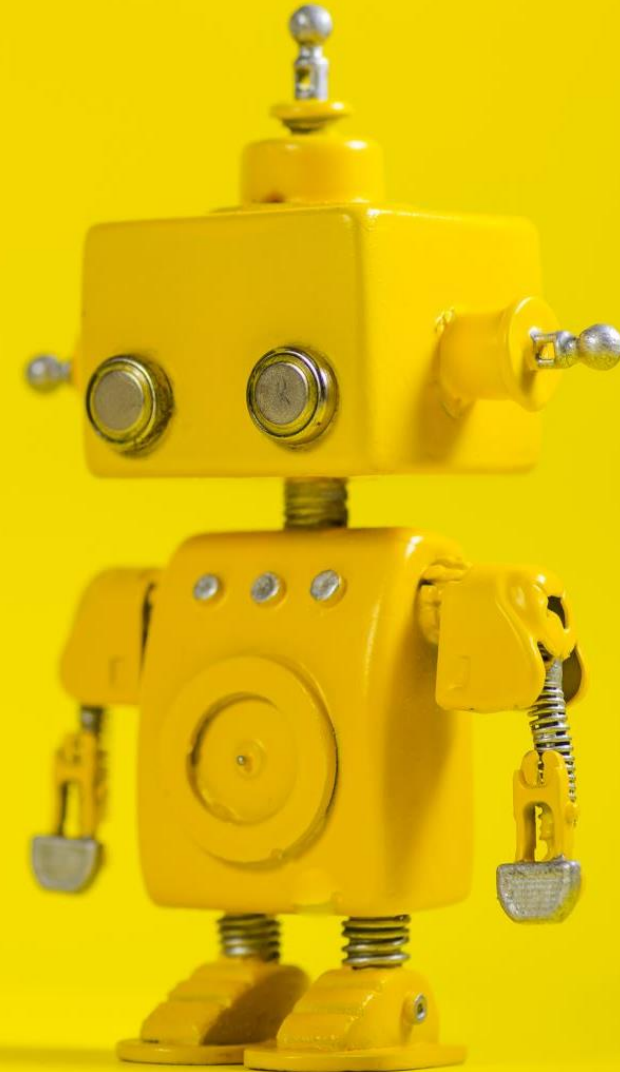
# Mental Health & AI

- Diagnosis
  - Natural Language Processing
  - Facial recognition
- Help make sure patients stay active in their self-care
- Chatbots
  - Deliver first hand solution
  - Redirect to the right specialist
  - Initial support if not ready to open up



# Who is HOA ?

- HOA doesn't replace a therapist
- Maintain a conversation to recognize a pattern
- Gives back an appropriate solution
- Combination of technologies
  - Conversational Chatbot
  - NLP
  - Deep Learning Neural Network
  - API + DB connection



How does it work ?

DL NN TOPIC

CHATBOT

API - DB

# How does it work ?

DL NN TOPIC

Trained on dialogue corpus  
Return best match  
Continuous learning – save  
conversation in SQL DB

API – DB

# How does it work ?

Sequential Tensorflow model  
Vectorized corpus from online client-  
therapist forum  
Return 1 – 3 most likely topics

Trained on dialogue corpus  
Return best match  
Continuous learning – save  
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API – DB



# How does it work ?

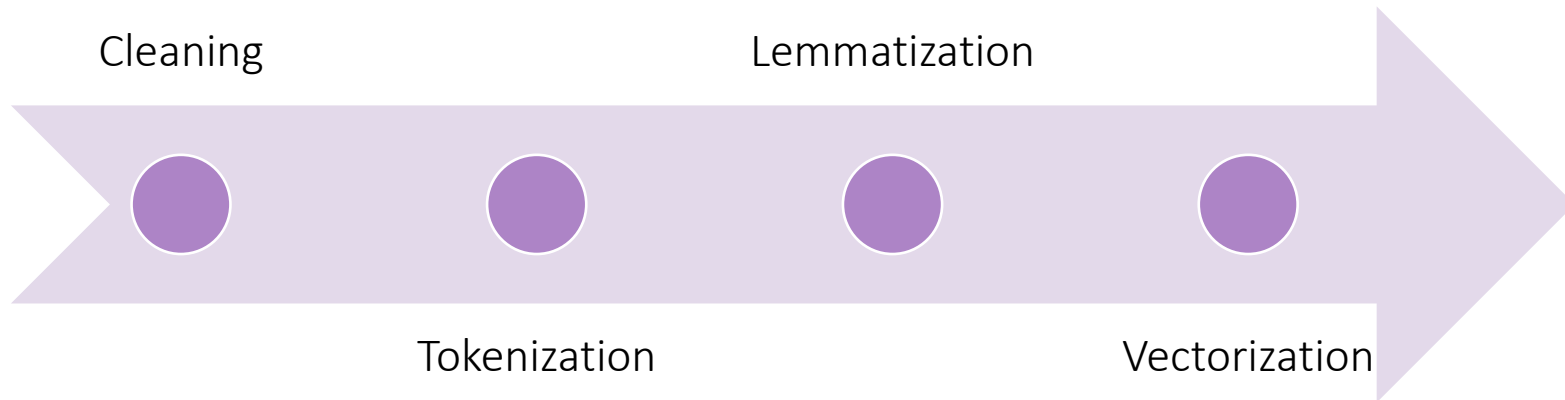
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conversation in SQL DB

Linked to NN output  
Return answer from medical website  
via API connection

# Performance

- Chatbot and NLP :
  - 3 600 conversations
  - Dialogue Corpus
  - Vectorize on 1 000 most common words from corpus



# Performance

- Parameters:

- 3 600 conversations
- 18 outputs
- 85-15% split

- Training set :

- Accuracy : 96%
- Loss : 0.07

- Test set :

- Accuracy : 77%
- Loss : 0.95

RELATIONSHIPS

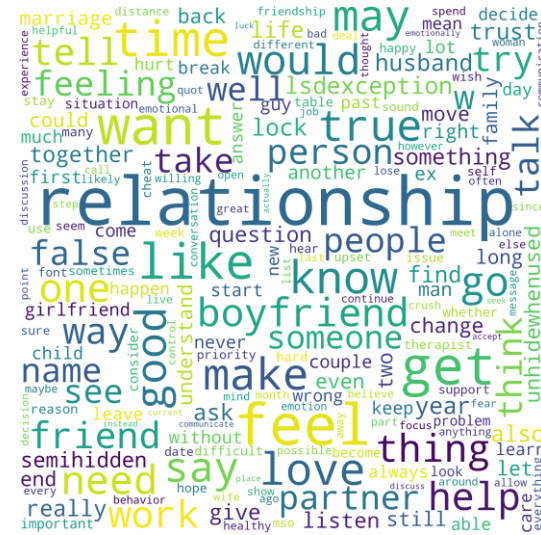
DOMESTIC VIOLENCE

SELF-ESTEEM

LGBTQ

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## RELATIONSHIPS

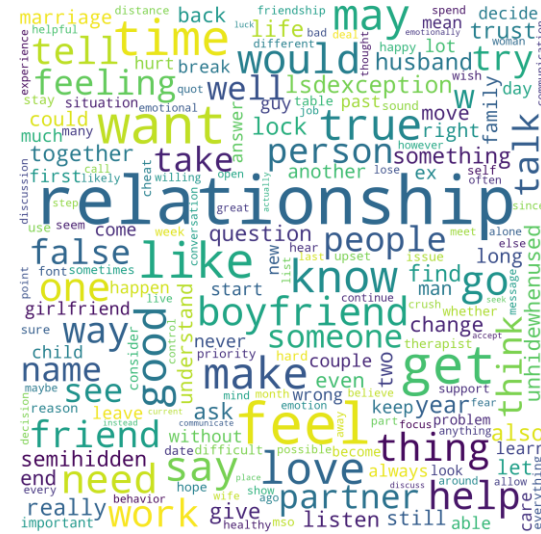
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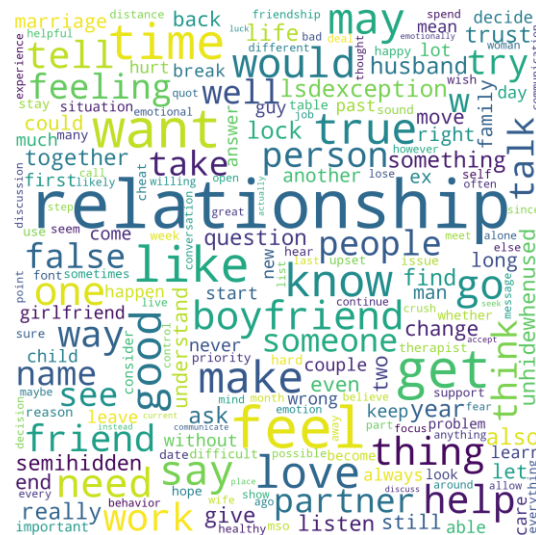
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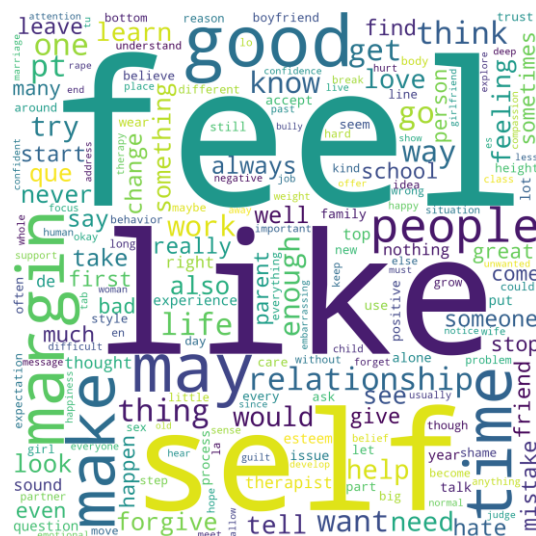


## RELATIONSHIPS



## DOMESTIC VIOLENCE

## SELF-ESTEEM



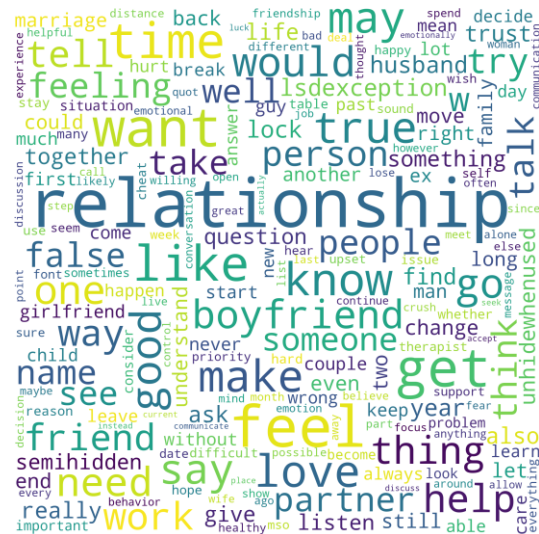
LGBTQ

LGBTQ



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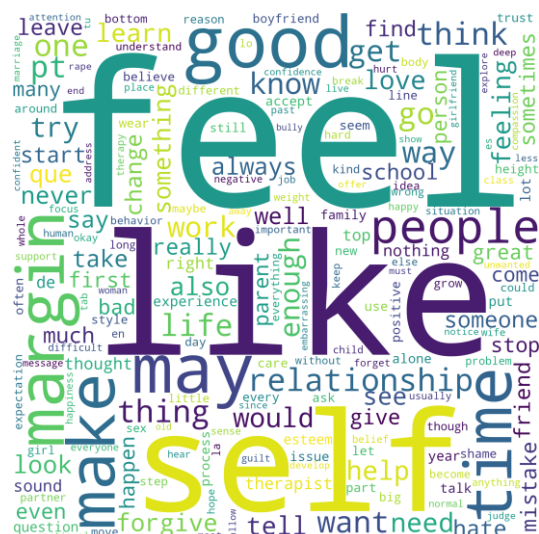


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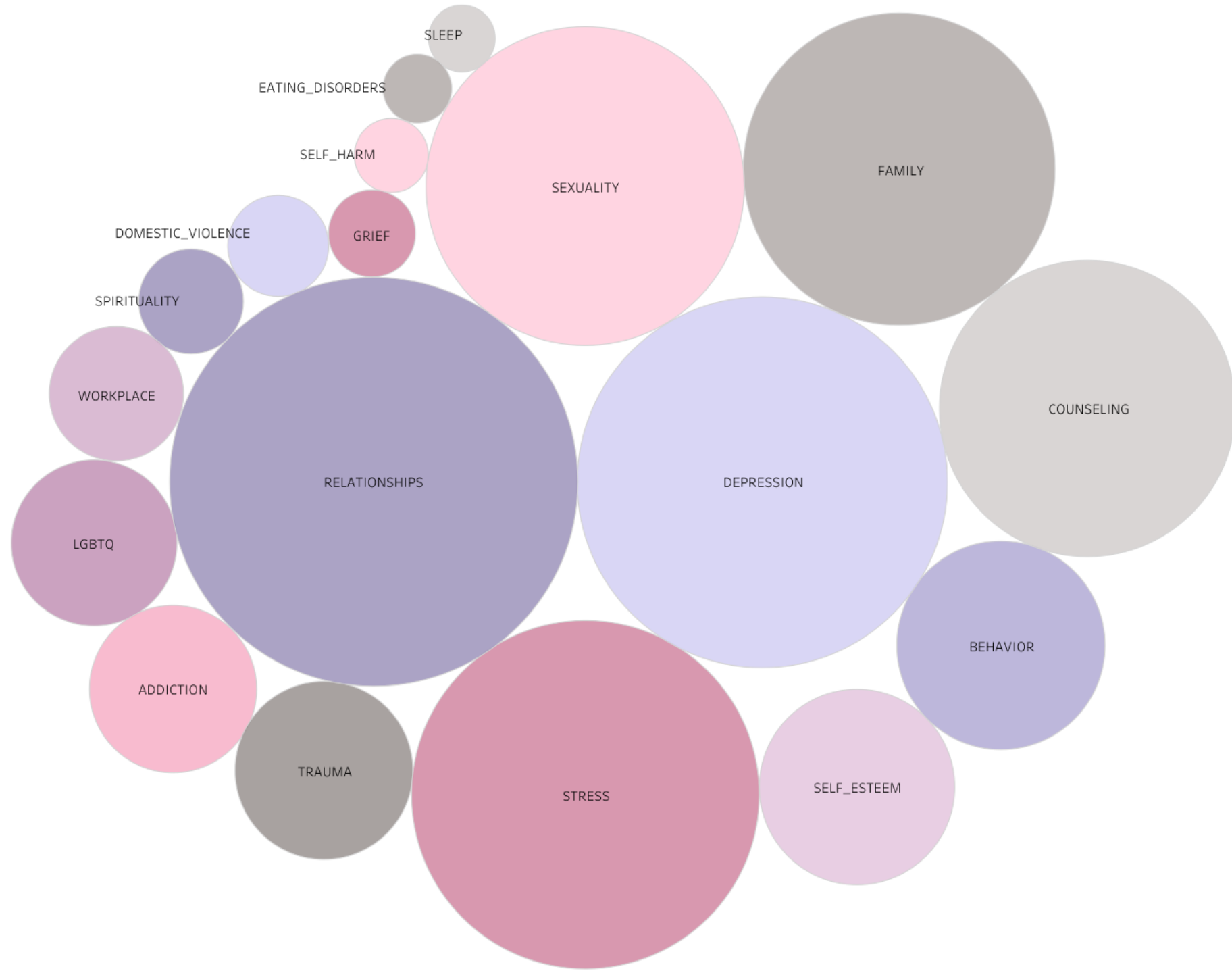
## DOMESTIC VIOLENCE

## SELF-ESTEEM



LGBTQ







DEMO

DISCLAIMER:

You are about to talk with a generated chatbot, made to provide you with the most appropriate solution. Some answer might not always be the best and it is always good to double check with a specialist.

Hoa: Hi! My name is Hoa, and I'm here to help you find a solution. Please, can you describe your issue ?  
If you wanna exit this conversation, then type "exit".

You:



Hoa: Hi! My name is Hoa, and I'm here to help you find a solution. Please, can you describe your issue ?  
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You: hi

Hoa: How are you doing?

You: i feel insecure

Hoa: I think you need more help than you've got.

You: How can I tell if my spouse had sex with a prostitute?

Hoa: Can you tell me more about how you feel? 

You: My spouse visited the red light district a couple of years back in Amsterdam. After he got back from the trip he got me tested for stds. In the aftermath he has provided multiple versions of what happened, from having a total blackout to being touched by a prostitute. How do I know if he had sex?

Hoa: Sorry to hear that..

Hoa: I understand you have issues with sexuality

Hoa: This website has meaningful reSSources, try calling their helpline as well : <https://www.healthdirect.gov.au/sexuality-mental-health>

You: exit

Hoa: Mental health is serious. You're not wasting anyone's time. Take care my friend ! 🤖

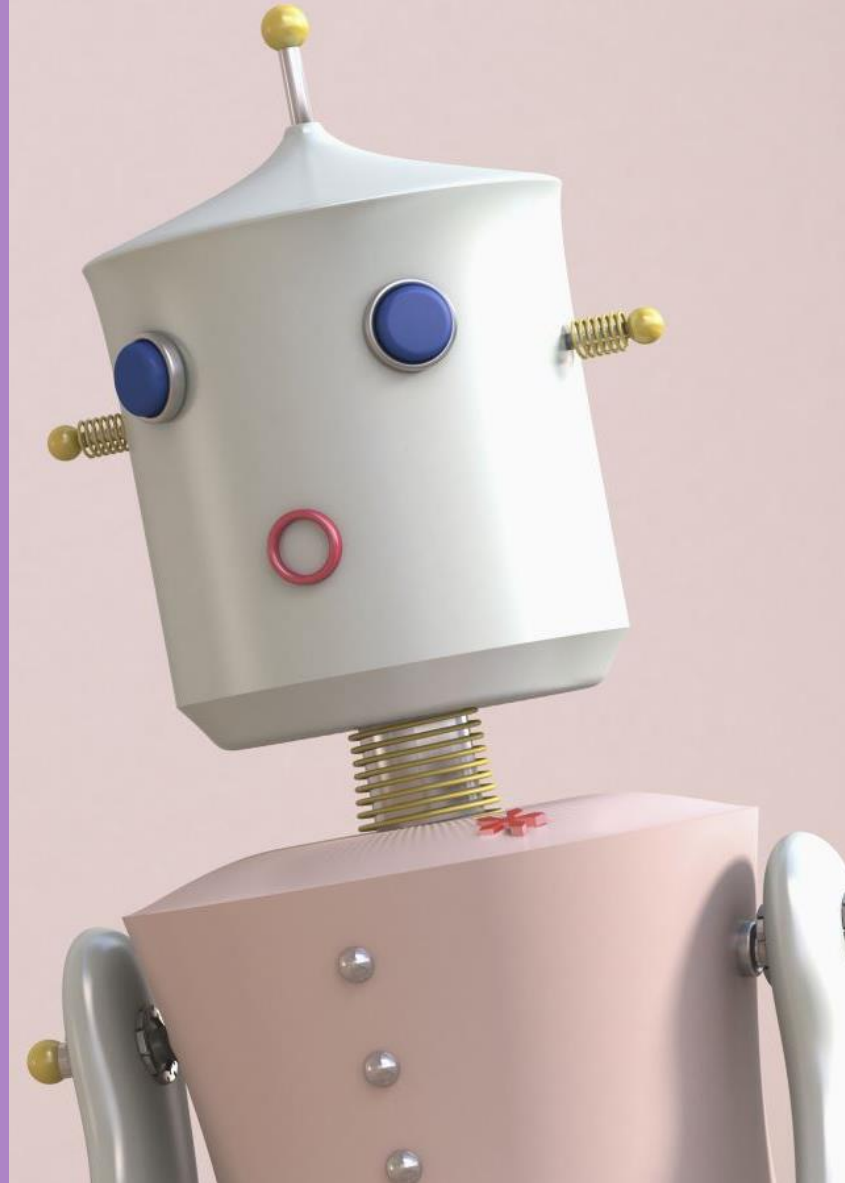
# Improvements

- Develop an interface or integration
- Train HOA & the DL algorithm with more data
- Use key words recognition
  - Topics + Subtopics
  - Better understanding of the subject
  - More solutions
  - More personal



# Conclusion

- HOA is not functional yet
- For DL and Chatbot, dataset is too little
- NN model doesn't need many features to be good



# Thank you !

Do you have any questions ?

