Berner Fachhochschule

BurnoutWords – Burnout Detection using Natural Language Processing for the Clinical Psychology

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*« Machine intelligence raises deep **scientific**, **engineering** and **societal** challenges. We focus on identifying and defining **solutions** to these challenges. «*

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FNSNF
Fonds national suisse
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Swiss National Science Foundation

Applied Machine Intelligence Research Group AMI
http://www.bfh.ch/ami

at the Institute for Data Applications and Security IDAS
http://www.bfh.ch/idas

BurnoutWords
SNF Spark Grant
Duration: 03/21 – 02/22
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http://www.burnoutwords.ch

Context

Burnout

Burnout is a syndrome conceptualized as resulting from chronic workplace stress that has not been successfully managed. It is characterised by three dimensions: 1) feelings of energy depletion or exhaustion; 2) increased mental distance from one’s job, or feelings of negativism or cynicism related to one's job; and 3) a sense of ineffectiveness and lack of accomplishment. […]

Source: *International Classification of Diseases 11th* Revision ICD-11 (WHO)

Image Source: pixabay.com

Current approach: Inventories

Example (extract) [1]:

Strongly Agree	Agree	Disagree	Strongly Disagree
1	2	3	4

After working, I have enough energy for my leisure activities

There are days when I feel tired before I arrive at work

It happens more and more often that I talk about my work in a negative way

Image Source: pixabay.com

Limitations of Inventories

- Users faking their results [2]
- Selecting extremes [3]
- Defensiveness/denial and social desirability bias [4]

Why not using free-text questions instead?

- Promising approaches in literature [5]
- Language often plays a central role in diagnosis in clinical psychology [6]

Text writing?

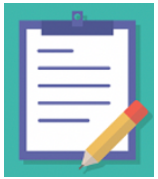
Interviews?

Free-text questions?

Why not using free-text questions instead?

- Promising approaches in literature [5]
- Language often plays a central role in diagnosis in clinical psychology [6]
- However, human labour cost in evaluation is a major obstacle

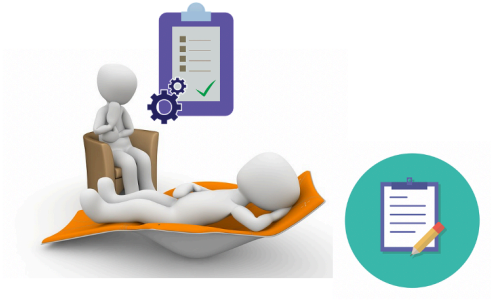
Transcription
(if required)



Manual text
analysis

Indication for burnout?

Burnout Words



Developing smart burnout detection with automated text-based technologies for the clinical intervention of the future

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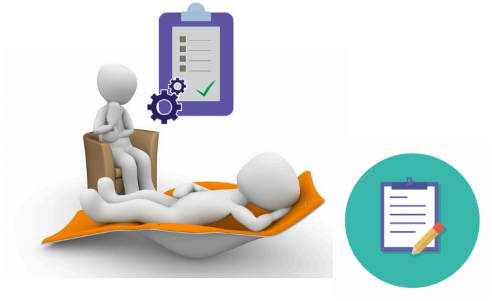
Image Source: pixabay.com

Project Goal:
Explore Natural Language Processing (NLP) methods to automatically **detect burnout** in texts

Burnout Words



Developing smart burnout detection with automated text-based technologies for the clinical intervention of the future

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Image Source: pixabay.com

Vision:
Enable the development of **new tools for the clinical psychology** of the future, based on free-text questions

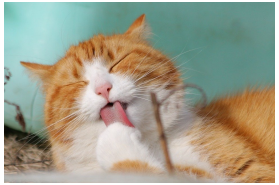
Other work in the field

- Majority: Depression detection based social media data
- Analyzing language use of depressed college students in essays [7]
- Studying the risk of burnout in comments/issues from a software development management tool [8]

→ Few work based on confirmed patient data or studying the burnout syndrome

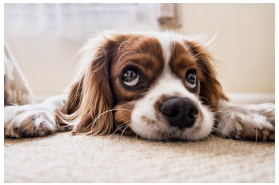
Machine Learning in a Nutshell

cat



cat

dog



dog

...

?? → cat

Training Data → Model

Image Source: pixabay.com

Project BurnoutWords

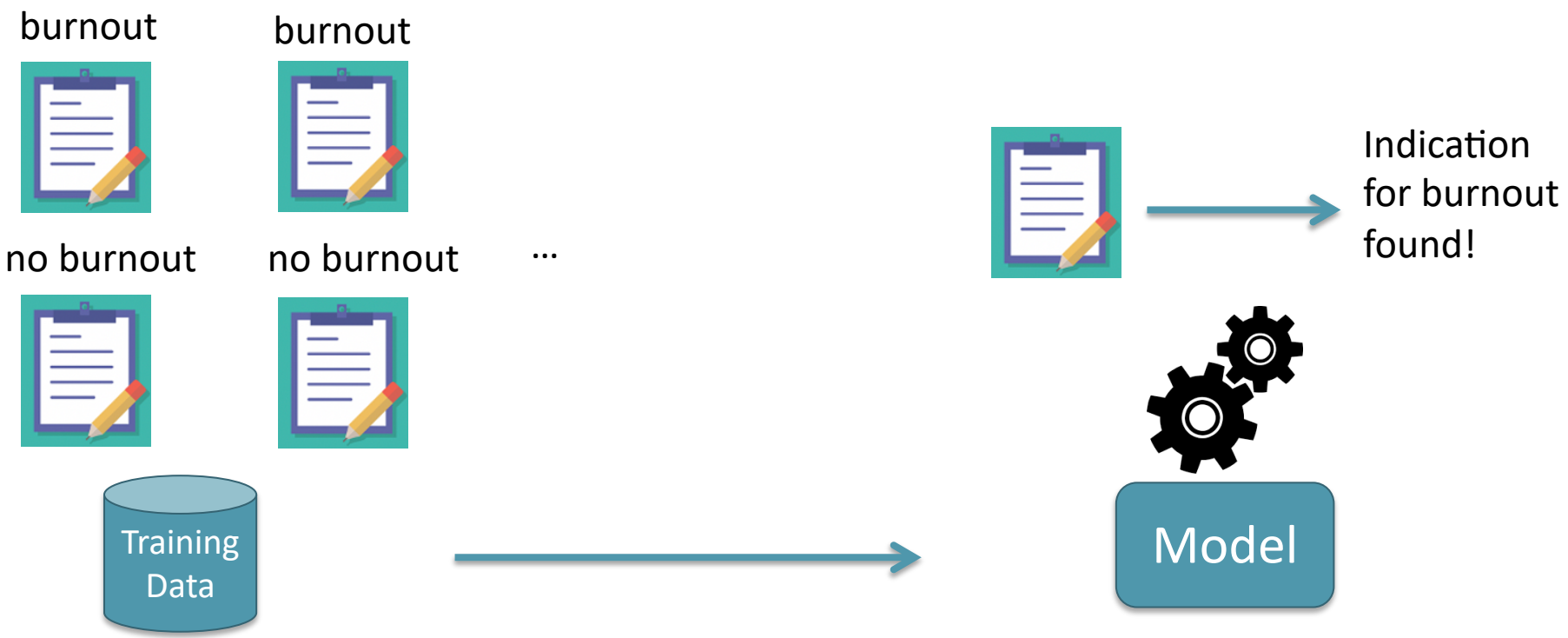


Image Source: pixabay.com

Challenge: Gathering data

- Fully anonymized datasets
- Quantity of data
- Quality of data

Challenge: Gathering data

- Dataset 1: Transcribed interview extracts from existing research

Image Source: pixabay.com

Challenge: Gathering data

- Dataset 2: Anonymized posts from online forums

Image Source: pixabay.com

Challenge: Gathering data

- Dataset 3: Two anonymous online surveys (data collection ongoing)

Anonymous public survey

LimeSurvey

http://www.umfrage.burnoutwords.ch

Anonymous patient survey with clinical partners

Image Source: pixabay.com

First results and next steps

- Even though quantity of data is still limited, we have first promising results
- First classifier results are cleary above the baseline
- Next steps:
  - Increase the dataset
  - Improve our classifier
  - Interdisciplinary follow-up project

Image Source: pixabay.com

Vision

- Extend our approach
- Provide the basis for new methods in clinical psychology
- For different diagnoses and syndromes
- Provide handy tools for practitioners

Image Source: pixabay.com

Support our research by donating text!

- Completely anonymous
- Each word counts!

http://www.umfrage.burnoutwords.ch

Image Source: pixabay.com

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Questions, Discussions?

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