

Probably Fun

Games to teach Machine Learning

$$p(\text{😄} | \text{🎲}) = 1$$

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www.academis.eu/probably_fun

Two great board games



Ark Nova:
build a zoo and protect animal species

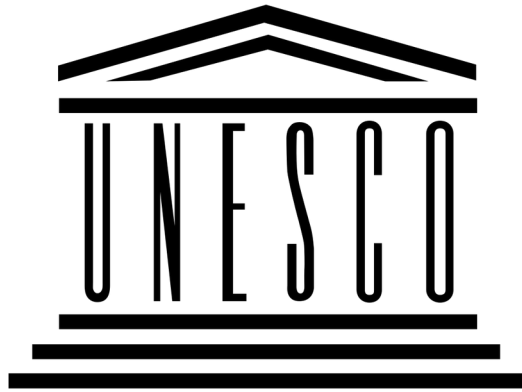
(playtime 2+ hours)



Terraforming Mars:
make Mars warm & cozy

(playtime 2+ hours)

Board games are culture



Board gaming in Germany is recognized as immaterial cultural heritage by UNESCO

www.unesco.de/staette/brettspiele-spielen



You can get certified as
"Fachkraft für Gesellschaftsspiele"

www.brettspielakademie.de

Games contain Data Science





Quartet cards used for plotting



dice baked before χ^2 -testing



binomial distro in "Zauberberg"



graph centrality in "Pandemic"

Wordle

Preparation:	almost none
Duration:	<5 minutes
Effect:	wake up class repeat keywords

Agenda

1. Decision Trees
2. Bag of Words
3. Language Models
4. Bar Quiz
5. Q & A
6. game rotation

Decision Tree

Guess the animal

Random Forest

- Preparation:** print worksheets
(or bring drawing paper)
- Duration:** 15 minutes
- Effect:** simulate complete ML model
easy to follow up with theory and/or
practical exercises

Bag of Words

Guess which text document it is

Take 1: simply use all words:

right unless honking first
pass good practicality implementation
errors complex often obvious
preferably readability refuse rules
explain now one never idea flat
temptation namespaces aren't
guess let explicit bad face hard
simple way enough may implicit
easy dutch silenced beautiful special

Take 2: sort by frequency

I like to shine a bright sky

we're
beautiful
light
away
right
see
sun
saw
hold
shooting
felt
the
knew
eye
alive
vision
happy
energy
inside
be
tonight
ecstasy
star
that
i'm
choose
bright
first
at
your
sky
you
when
sight
sea
so
and
of
find
rays
me
life
oh
to

Take 3: remove stop words

A word cloud featuring various words in different colors and sizes, arranged in a circular pattern. The words include: nights, spent, die, many, lay, got, life, side, go, welcome, crumble, back, know, loving, afraid, give, one, cause, alive, petrified, now, around, long, tried, without, stay, door, never, think, kept, live, break, turn, walk, thinking, anymore, first, goodbye, and love. The word 'love' is the largest and most prominent in the center.

Take 4: lemmatize (reduce to basic form)

long love play hide go
say game something
easy trouble know place far
wrong now believe seem need
away suddenly

Take 5: Tf-Idf

(rank words higher if they rarely occur in any other song)

galileo

Bag of Words

Preparation: generate word clouds
(and think hard which documents class knows)

Duration: <10 minutes

Effect: simulate the main concepts
should be backed up with theory
and/or practical exercises

Small language model

Two volunteers: explain a concept to the audience.
take turns saying 1 word
(A B A B A B ...)

Audience: guess which concept it is

Small language model

Preparation: very little

Duration: <10 minutes

Effect: priming
prepares the ground for introducing
token prediction, softmax

also works as a game to repeat

Wisdom of the crowd

Task: We will ask you a question.

Decide which is the answer most people in the audience will give.

Everytime your guess is correct, you get 1 point.

Wisdom of the crowd

Preparation: write down a few common questions

Duration: <10 minutes

Effect: discuss reasoning versus hallucination

also works as a short energizer

Team Quiz

Task: Form a team of 4-5 people

Answer the 10 questions on the sheets
(distribute them to parallelize)

NO PHONES OR COMPUTERS!

Team Quiz

Preparation: 1-3 hours to create the quiz

Duration: 30 minutes

Effect: team building
recap

More Games

Find a table with a game

and a group of 5-6 people

read instructions

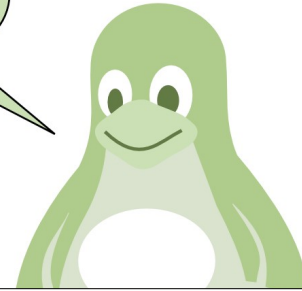
github.com/krother/probably_fun
→ **workshop** → **instructions**

play





***Thank
You***



Course topics on www.academis.eu