Abzu's QLattice, a new explainable AI

Jaan Kasak
November 2021

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CPH 💖 BCN

Meet the Abzoids

European
Leading deep tech innovation in ethics and AI.

2 locations
Offices in Barcelona + Copenhagen.

22 Abzoids
Highly skilled experts in a teal organization.

8 nationalities
Brazil, Denmark, Estonia, GB, Germany, Italy, Spain, + US.

€ 8,1 million
Raised in investment since Abzu's founding in January 2018.

Casper Wilstrup
CEO

Chris Cave, PhD
Mathematician

Elizabeth Gil-Roldán
Solutions + Projects

Elyse Sims
Marketing + Communication

Emil Lundt Larsen
Developer

Jaan Kasak
AI Engineer

Jonas Nygreen
Commercial

Jonas Wilstrup
Finance + Operations

Jonny Sloan
Senior Software Engineer

Karin Bondgaard
Product Lead

Kevin Broløs
Mad Scientist

Liv Toft
Intern

Lykke Pedersen, PhD
Bioinformatician

Marco Salvatore, PhD
Bioinformatician

Maria Jacobsen
Office Lead

Martin Mathiasen
Business + Customers

Meera Machado, PhD
Data Person + Physicist

Miquel Triana Iglesias, PhD
Data Scientist

Niels Johan Christensen, PhD
Computational Chemist

Sam Demharter, PhD
Bioinformatician

Tom Jelen
Software Engineer

Valdemar Stentoft-Hansen
Data Scientist

Victor Galindo
Software Engineer

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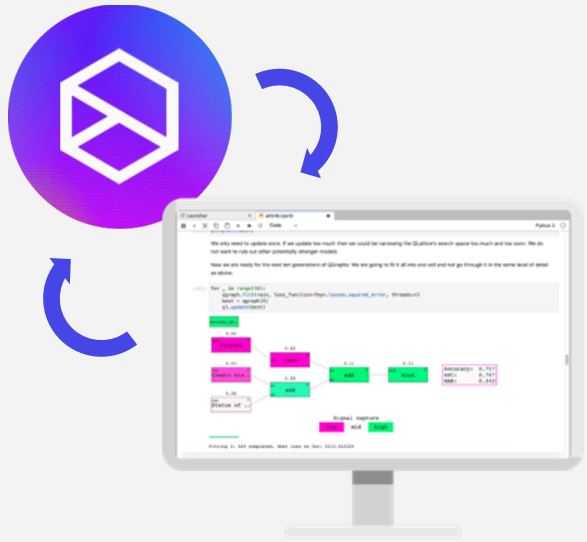
THE TECHNOLOGY

The QLattice is a secure, high-performing, easy-to-use simulator

The QLattice® [Abzu]

The QLattice is a high-performance simulator (based on quantum field theory) that searches among all possible potential models for the one graph that reveals the mathematical model for your problem.

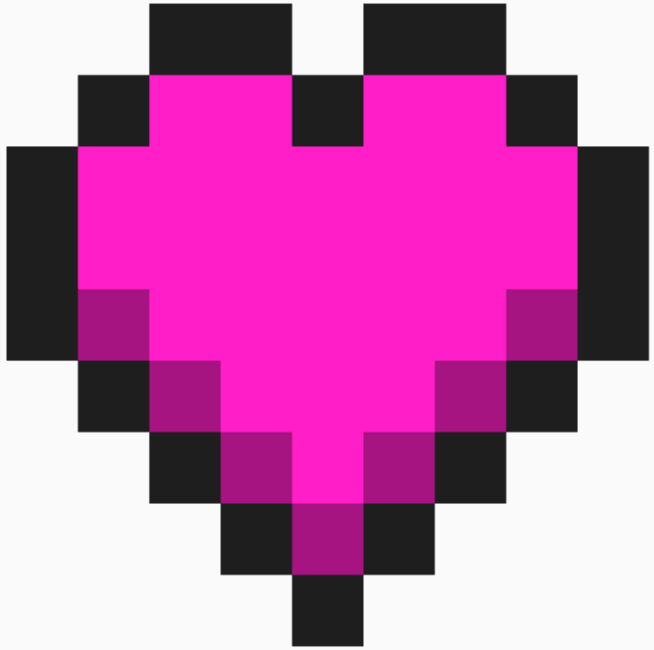


Feyn® [User]

Our Python library, Feyn, is used to interact with the QLattice from a Python environment.

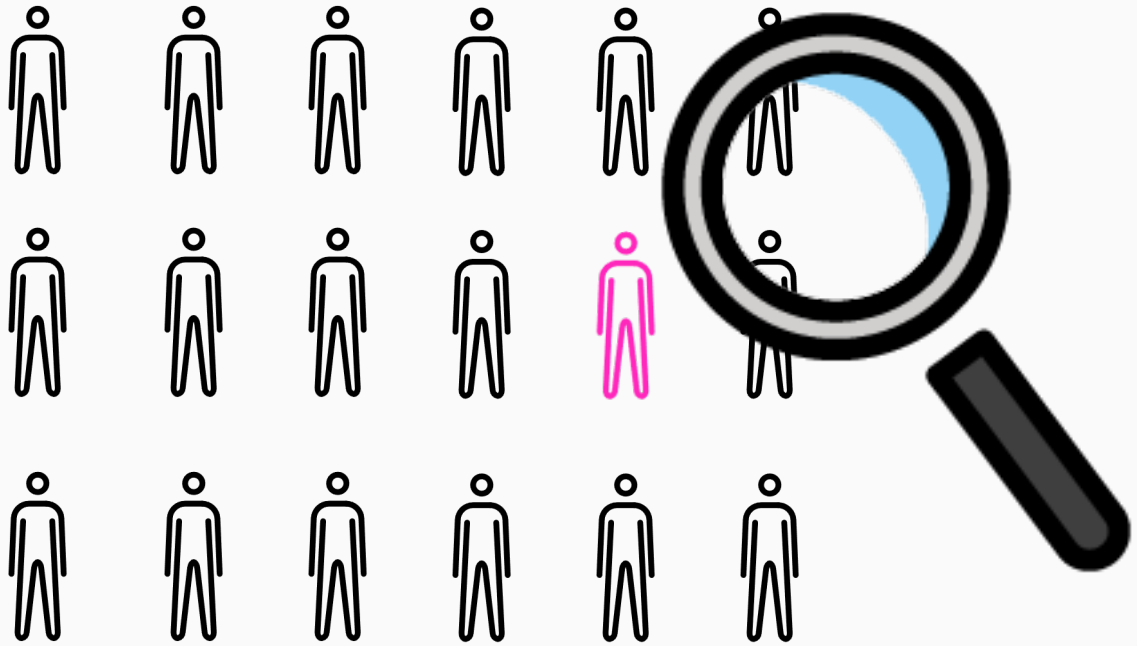
Data privacy by design

Heart failure case study



HEART FAILURE CASE STUDY

Problem 1: How do we predict a fatal outcome?



HEART FAILURE CASE STUDY

Problem 2: How do we explain the diagnosis?

… And could we prevent this outcome in the future?

BLACK BOX AI

Predictions:

"You at are risk of a fatal outcome, because the black box told me so."

THE QLATTICE

Predictions + explainability:

"You are at risk of a fatal outcome, and here's why…"

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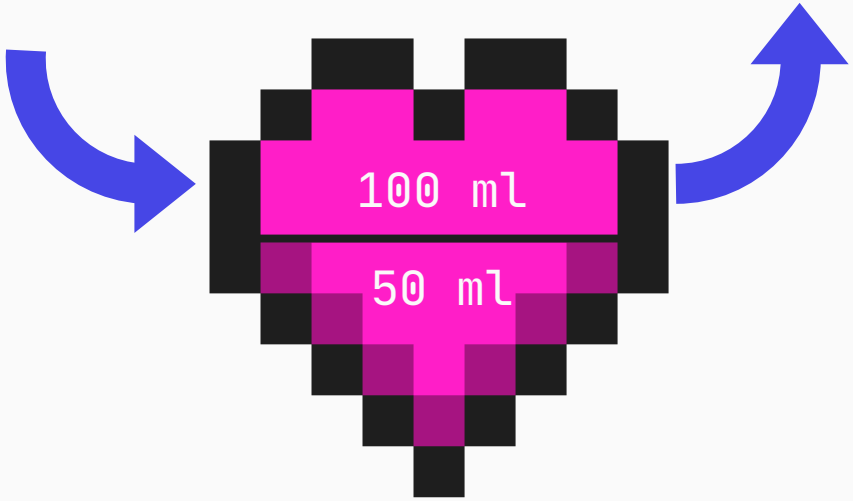
TIME TO DO MATH

Why is the inverse important?



$$\text{ejection\%} = \frac{100}{100 + 50} = \frac{2}{3}$$

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TIME TO DO MATH

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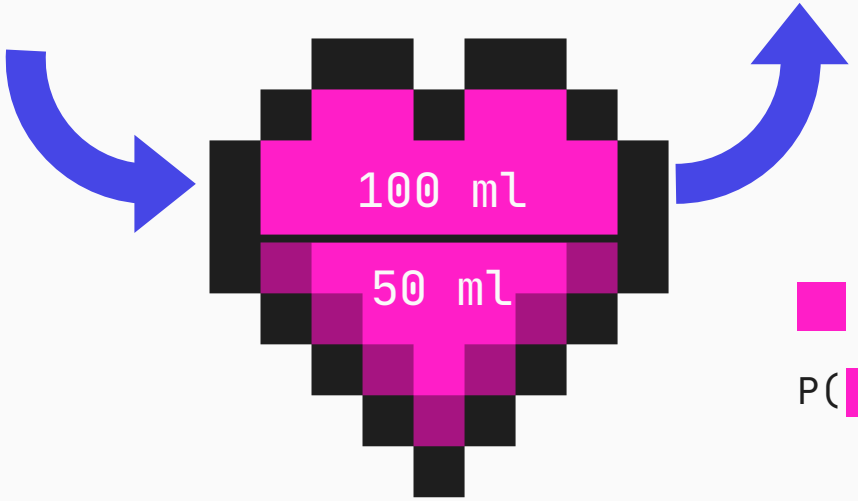

$$\text{ejection\%} = \frac{100}{100 + 50} = \frac{2}{3}$$

1 ml

P(stays in a heart after 1 beat) = 1 − ejection%

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TIME TO DO MATH

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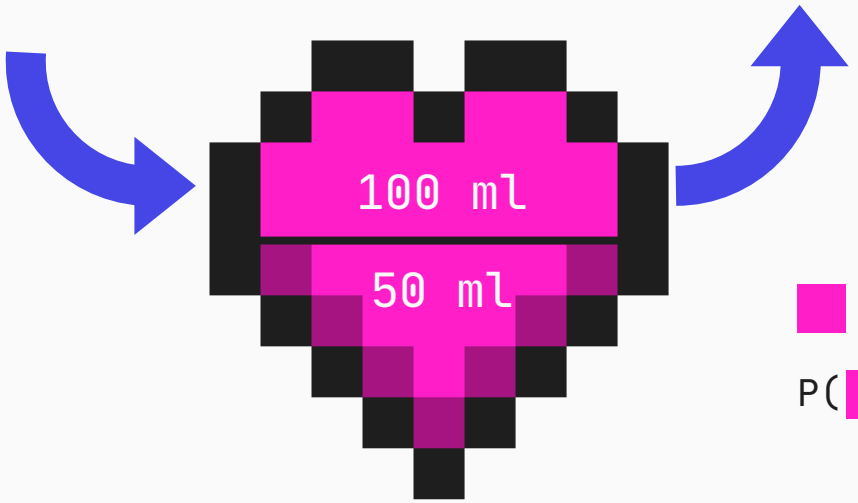


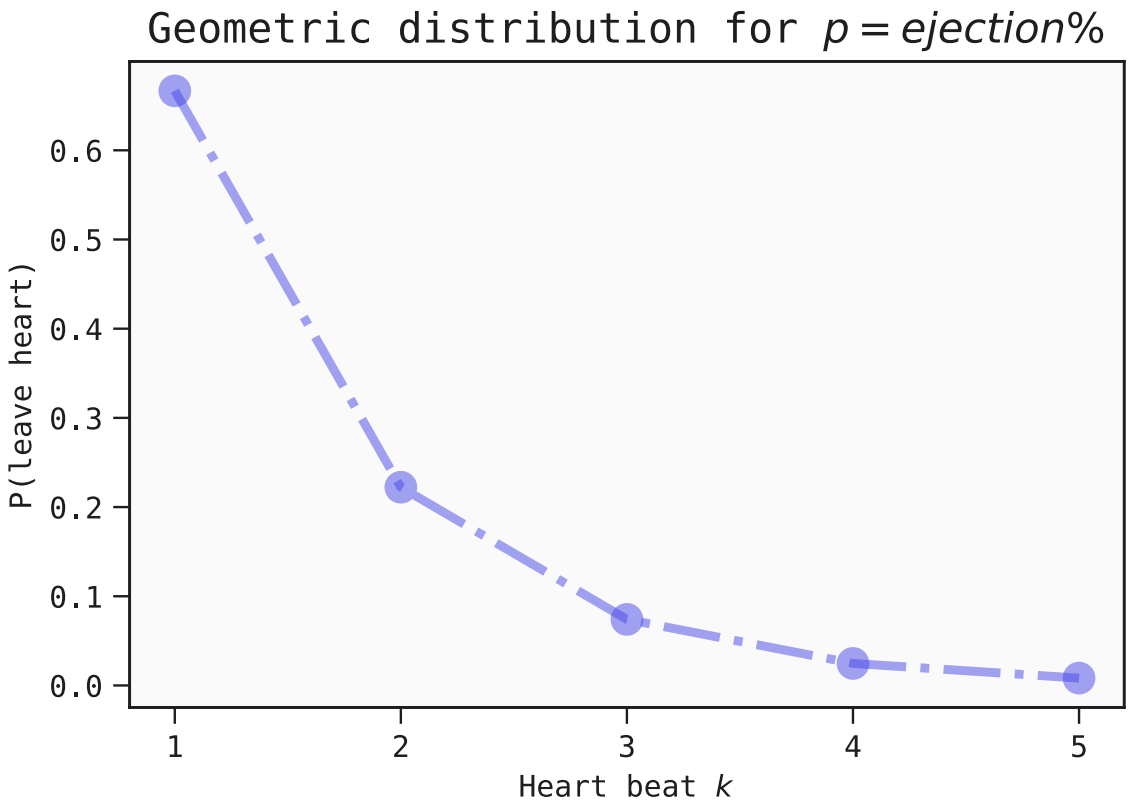
$$\text{ejection\%} = \frac{100}{100 + 50} = \frac{2}{3}$$

1 ml

P(stays in a heart after 1 beat) = 1 − ejection%

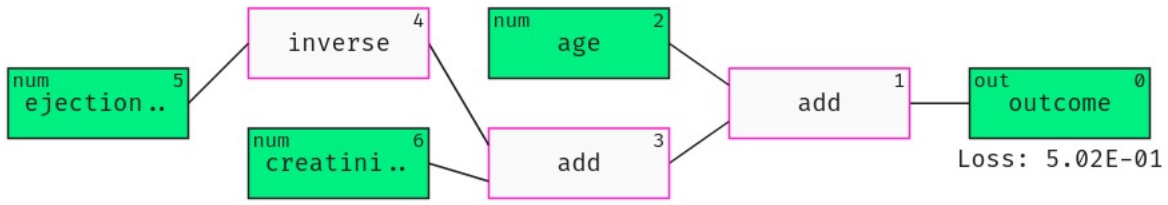
Q: What is the probability of leaving the heart on the k^{th} heart beat?

$$(1 - \text{ejection\%})^{k-1}(\text{ejection\%})$$



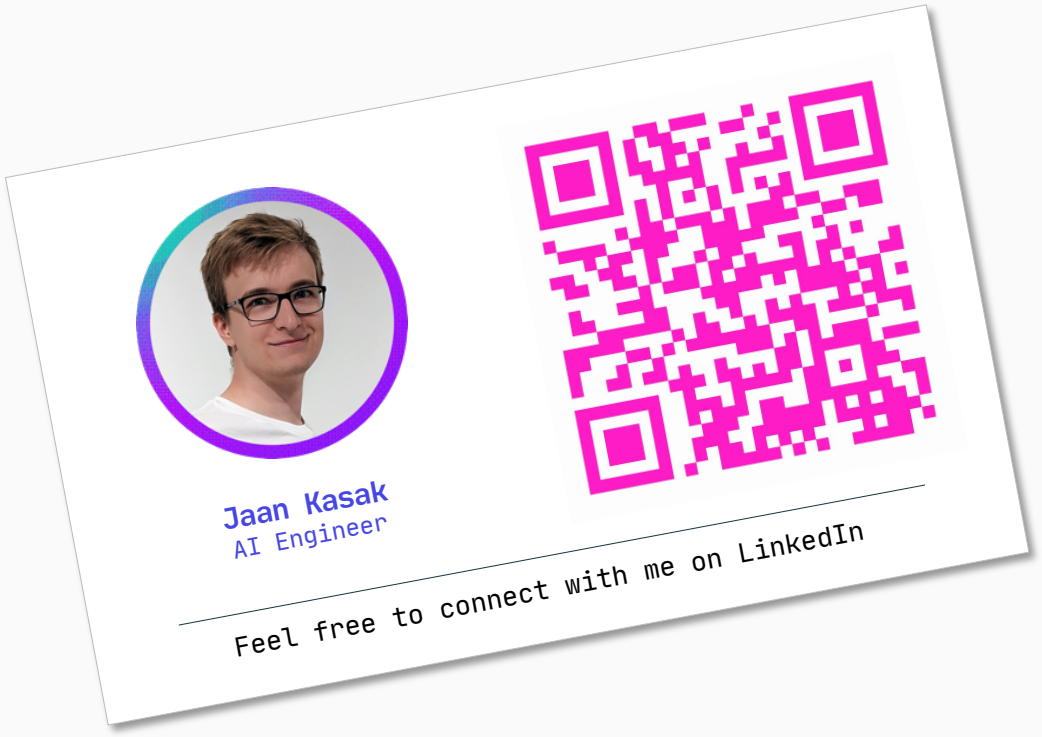
$$(1 - \text{ejection}\%)^{k-1}(\text{ejection}\%)$$

$$\text{Average value} = \frac{1}{\text{ejection}\%}$$



$$\text{Average value} = \frac{1}{\text{num ejection ..}}$$

The average number of heartbeats that a given unit of blood will stay in the heart is a much stronger indicator for a fatal outcome than the heart described as a pump (num ejection ..).



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KNOCK ON OUR DOOR, CALL US, STAN US

Thank you! And get in touch!

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