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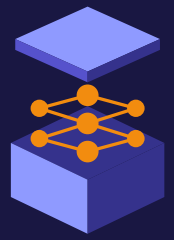

ExplainedAI

AI gives answers.

We give answers and REASONS.

Research-to-Business project

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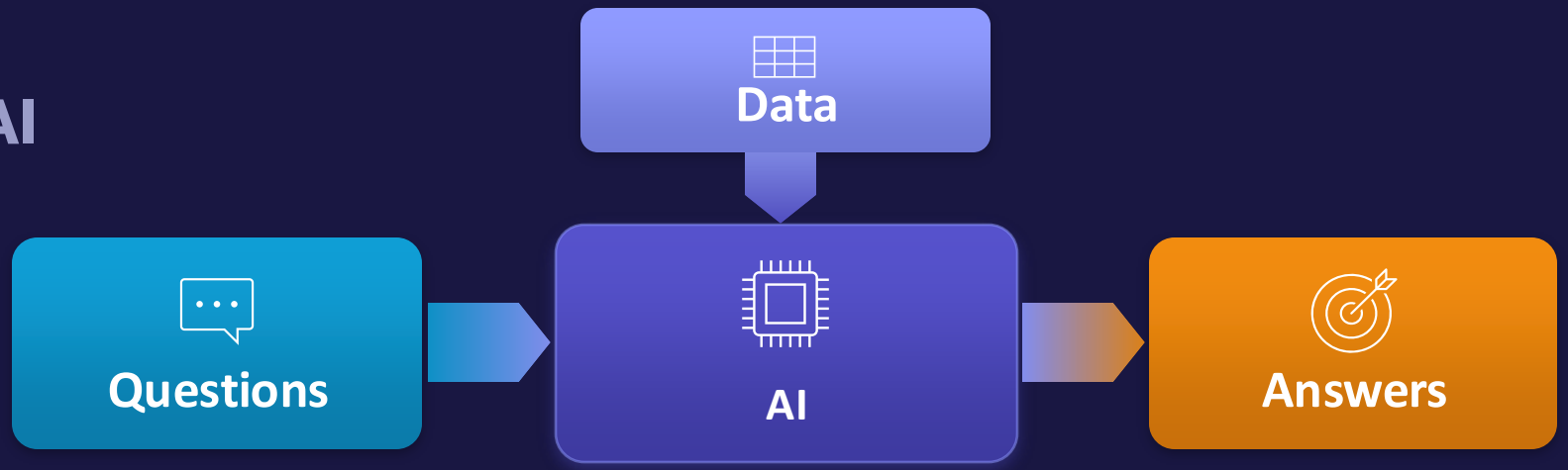
ExplainedAI

Traditional AI



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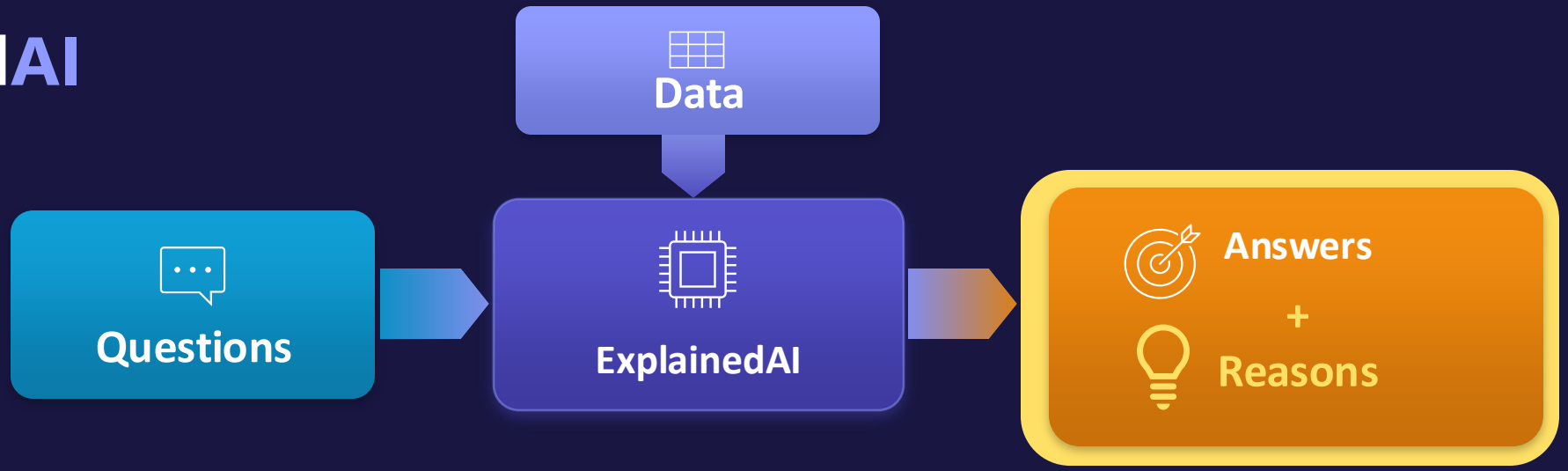

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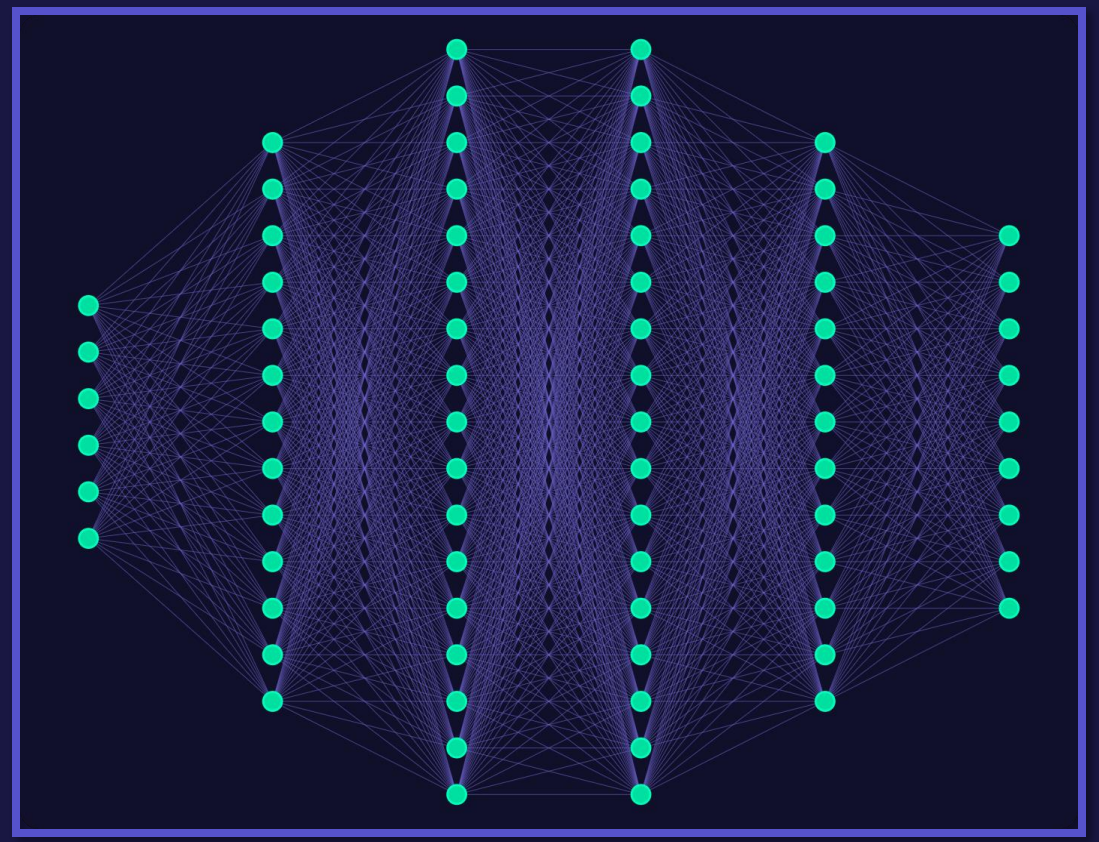
The Black-Box Problem

The Problem
Modern AIs are often **black-boxes**, meaning we do not understand the reasoning behind their answers

For example,
Neural Networks are often **massive and complex**, making it **very difficult** to understand how they work



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The Risk of Black-Box AI

Example A Black-Box AI gives a diagnosis, but **cannot explain its reasoning**

Can we trust it?
Hard to verify the reasoning

What if it's wrong?
Errors are invisible without explanations

Who is liable?
Creates legal and ethical exposure

Many **regulations** require **AI transparency** and **explainability**

EU AI Act (Art. 13)
High-risk AI must be transparent and understandable to users

GDPR (Art. 22)
Individuals have rights regarding automated decision-making and explanations

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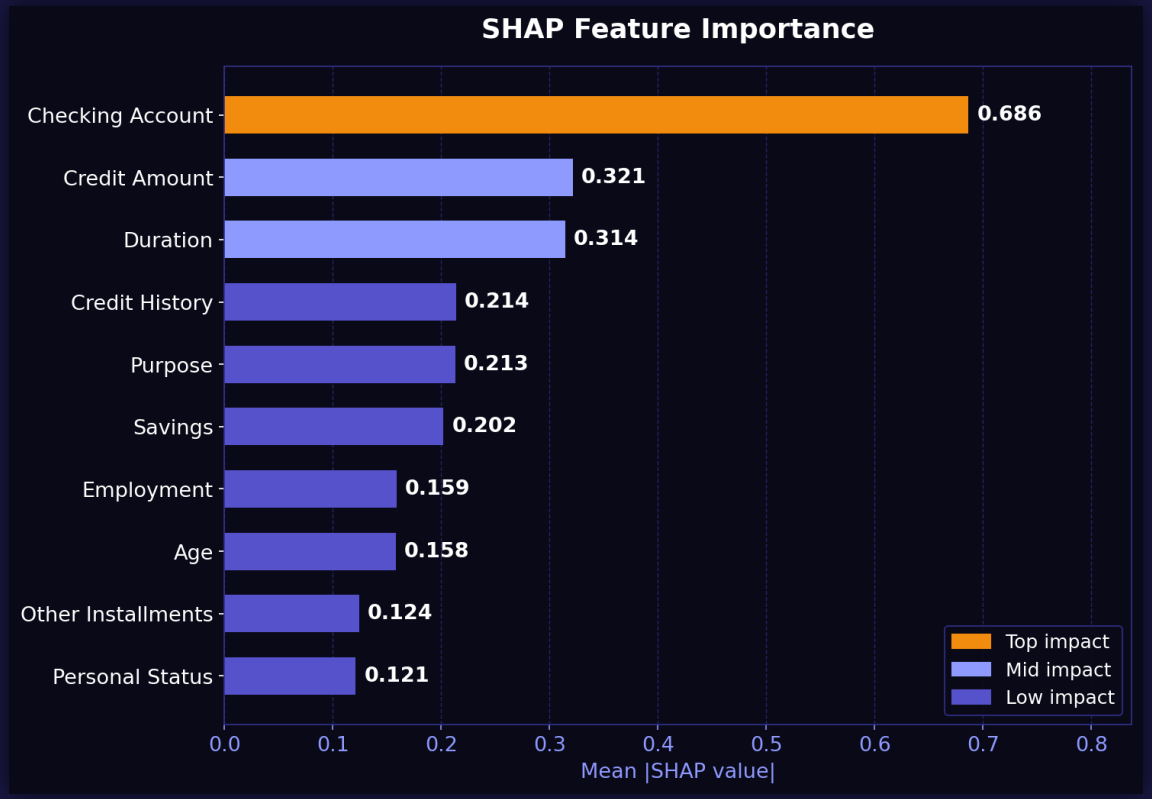
Explainable AI (XAI)

What is XAI?
Tries to explain answers given by black-box models

Most popular: SHAP
Assigns importance scores to each feature, shown as bar charts

SHAP often misleading
SHAP can be **misleading** [1] and can **fail** regulatory requirements



[1] Huang, X. & Marques-Silva, J. (2024). On the failings of Shapley values for explainability. Int. J. Approx. Reason., 171, 109112.

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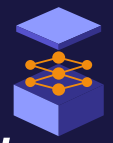
Value Proposition

What if you could understand how your AI actually makes decisions?

Now you can.  **ExplainedAI** *delivers transparent, interpretable AI systems — so you can see exactly why every decision is made, trust the outputs, and easily meet compliance requirements.*

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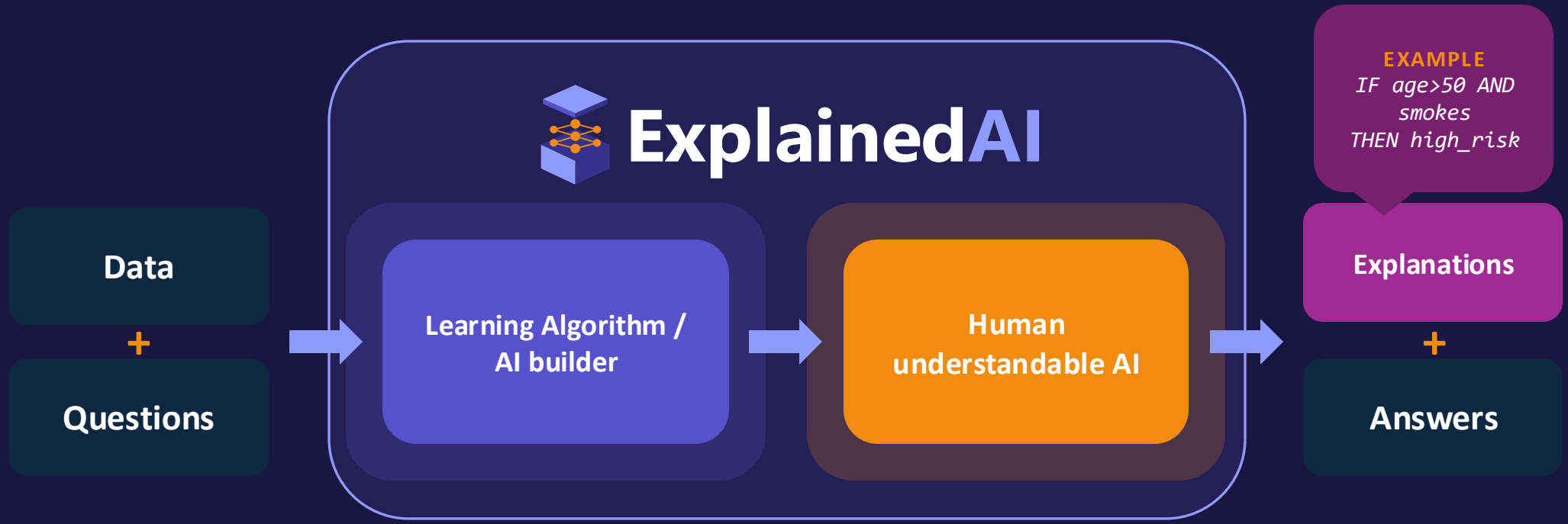
A new foundational AI framework



NOVEL LEARNING ALGORITHM
Not gradient descent or any standard.

REPLACEMENT FOR NNs and LLMs
Same problems but 100 % interpretable.

We have a working prototype you can test today!

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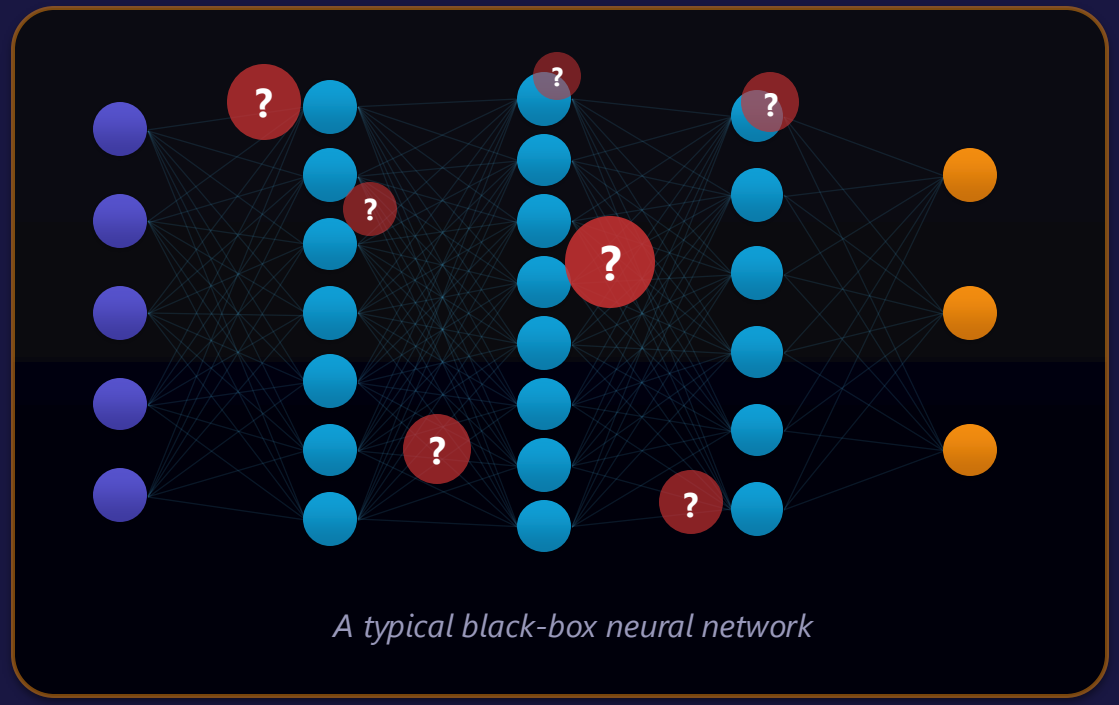
Black-box vs ExplainedAI

Black-box AI

- ✗ High accuracy
- ✗ Totally uninterpretable
- ✗ No guarantees that it works



A typical black-box neural network

ExplainedAI

- ✓ Also high accuracy
- ✓ Instantly human-understandable
- ✓ Trustable and easy to monitor

Is a tumor malignant?

```
IF Bare nuclei ≥ 6
OR Clump thickness ≥ 7
OR Cell size ≥ 5
THEN Malignant | ELSE Benign
```

Should an applicant receive a loan?

```
IF Balance < 0
OR Balance 0–200 AND Duration ≥ 24m
THEN Bad Credit | ELSE Good Credit
```

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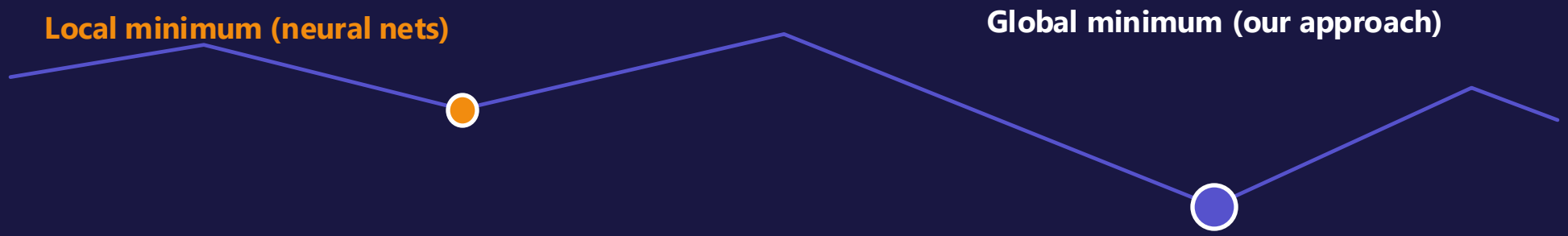
New ExplainedAI Methodology

Neural Networks: Local Optimization

- Neural networks rely on methods that converge to **local optima**
- **No guarantee** of finding the best model

ExplainedAI : Global Optimization

- Our algorithm finds the **globally optimal model**
- Made possible by new **statistical and mathematical methods** we have developed



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ExplainedAI explains other AIs

- Instead of replacing your AI, we can explain its behavior
- Answers given by your AI are fed into our solution and it explains them
- A simple solution for monitoring your AI

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ExplainedAI complements GenAI

Answers are mathematically derived from the data — never hallucinated

User Question

Powered by

GenAI + ExplainedAI

Human-Readable Answers

▼ Example ▼

Question

"Which tumors are malign?"

Data: Tumor-data

Processing

Builds explainable AI, GenAI interprets results

Answer

"Tumors with cell size variability over the standard threshold value 6 are malign."

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ExplainedAI Key Benefits

Interpretable & Human Understandable
Trustworthy and compact models with fully explainable decisions

Low Cost
Minimal hardware requirements and deployment costs

Lightning Fast
High-speed inference and training performance

Guaranteed Accuracy
Formal mathematical guarantees on prediction accuracy

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ExplainedAI

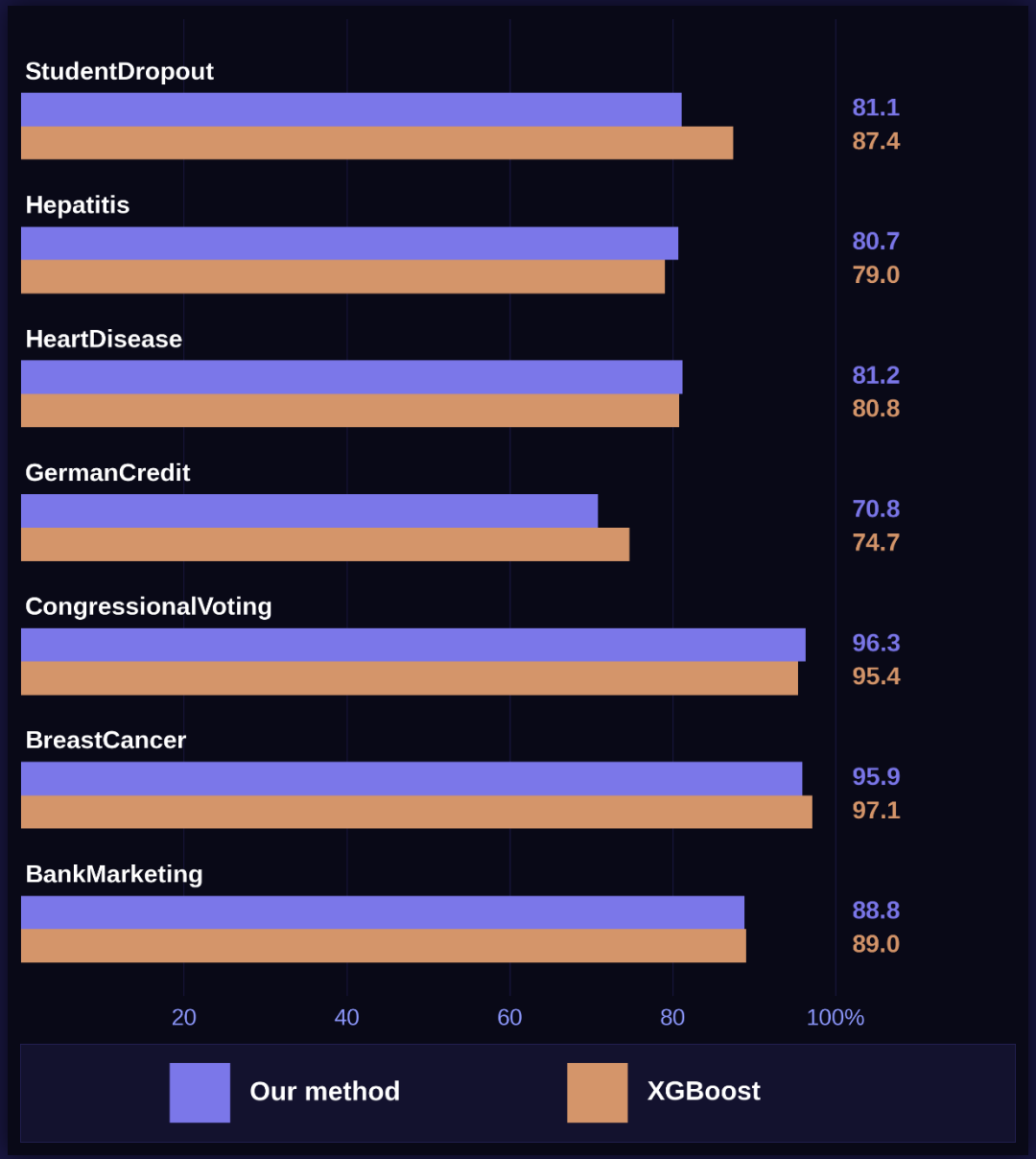
Excellent Accuracy

As Accurate as XGBoost — but Interpretable

Our solution matches the accuracy of **XGBoost**, the leading state-of-the-art method — yet our answers are **human-readable**, while XGBoost remains entirely opaque

Broad Applicability

Works across different industries such as **finance** and **healthcare**



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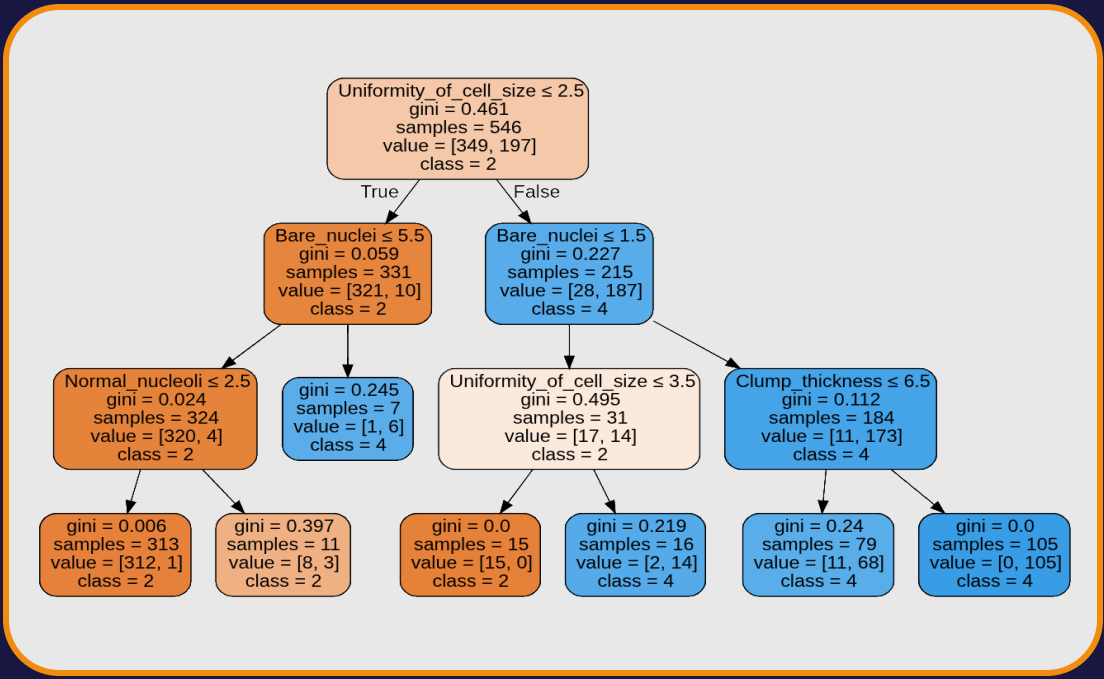
Comparison to Decision Trees

Decision Trees

✗ Can have unnecessary information
✗ Not easy to translate to everyday language



ExplainedAI

✓ Often significantly — sometimes exponentially — more succinct
✓ Easy to translate to everyday language
✓ Mathematical guarantees for the best possible answers

Is a tumor malignant?

```
IF Bare nuclei ≥ 6
OR Clump thickness ≥ 7
OR Cell size ≥ 5
THEN Malignant | ELSE Benign
```

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Comparison of Model Sizes

Dataset	Decision Tree	ExplainedAI
Breast Cancer	41.8	42.7
Diabetes	20.6	7.6
Huimausdata	102.4	57.1
Iris	10.8	2.1
Raisin	24.6	21.0
Student Dropout	133.6	123.9
Twoyearrecid	83.4	51.5

Our solution produces more compact — and thus more easily interpretable — AIs, while remaining more accurate

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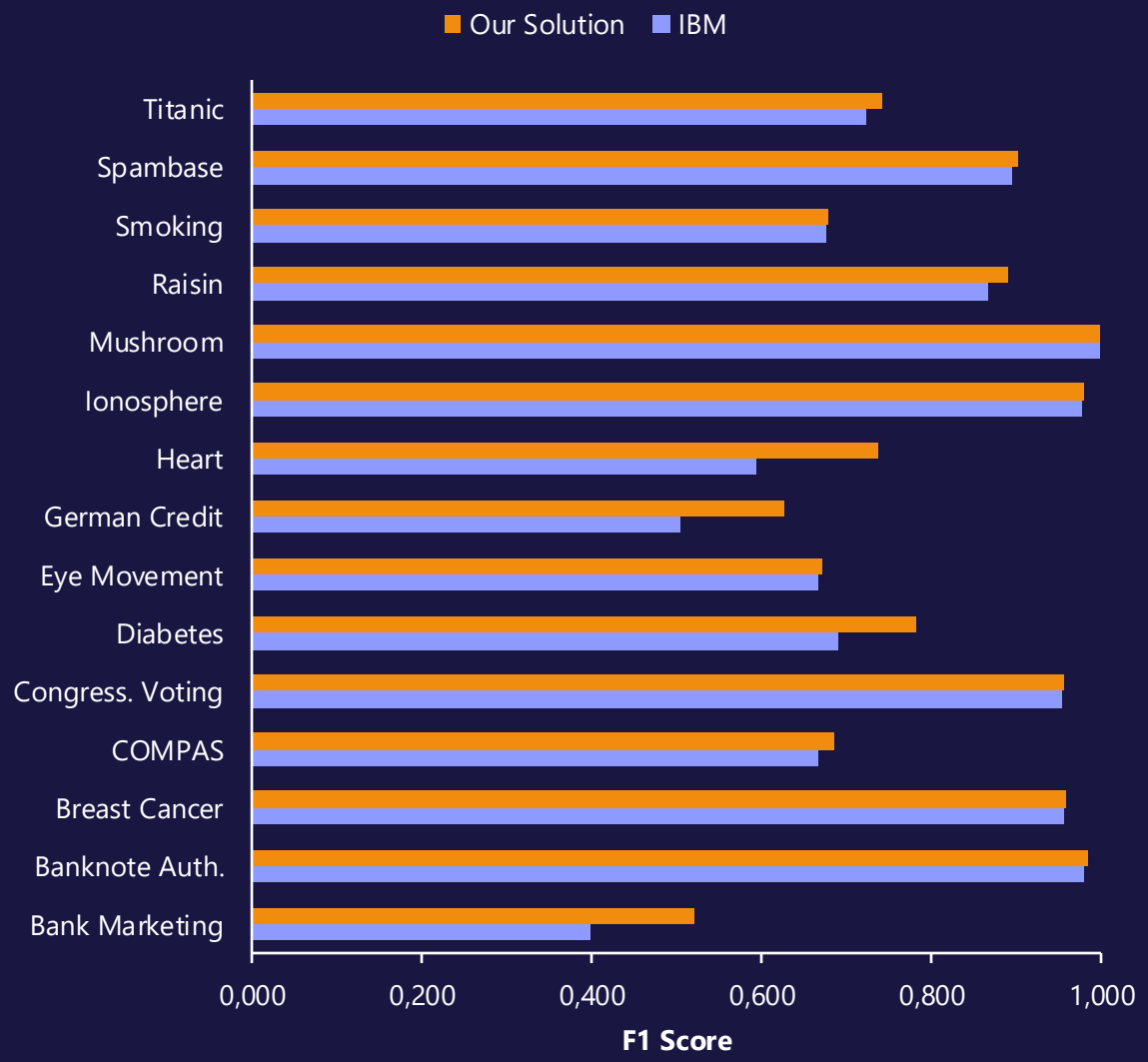
ExplainedAI Outperforms IBMs White-Box Methods



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Team

A world-class team in developing human-interpretable AI solutions.

Decades of experience in AI research and business operations.

Built on the Research Council of Finland's XAILOG project, led and coordinated by our team in 2022–2024.

Antti Kuusisto
20+ years in logic & AI research

Reijo Jaakkola
Award winning mathematician

Tomi Janhunen
Finnish AI Society Chair

Veeti Ahvonen
Published at NeurIPS and AAAI

Jussi Lemiläinen
25+ years as entrepreneur

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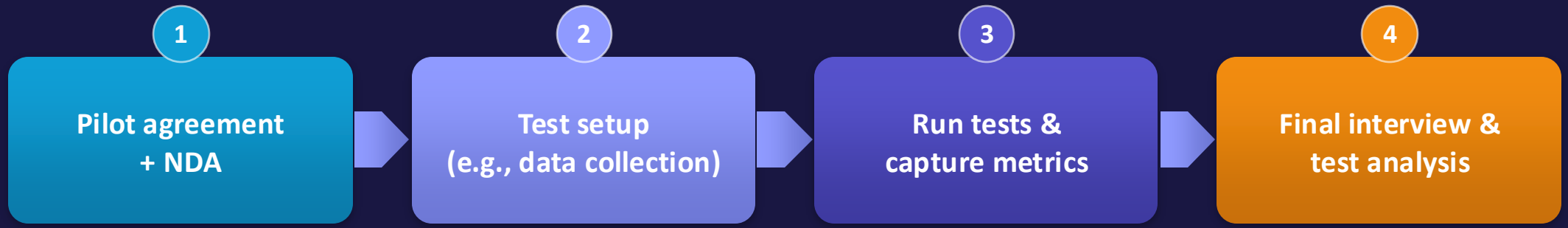
Join Piloting ExplainedAI

- We want to prove that our solution brings You value.
- We want to discuss partnership and deployment with You.
- We offer the pilot free-of-charge to You.
- We have the pilot platform ready for You.

Pilot Process



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Piloting Options

Choose the level of collaboration that fits your team

Option A: Self-Service

You receive a ready-to-use package and run it on your own data.

Best for benchmarking against your existing solution or discovering what our solution reveals about your data

Option B: Co-Creation

We collaborate to explore a new use case, iterating together to develop and validate a tailored solution.

Best for R&D on a new use case

Benefits of Piloting

Understand what drives your predictions — improve targeting to increase sales, or leverage explainable insights to build better models faster

Both options are free of charge

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Easy Integration

Scikit-learn-compatible Python library — fits into existing workflows with minimal changes.

Also available via MCP for GenAI assistants, and as plugins for commercial data platforms.

```python
from white_box_builder import WhiteBoxBuilder

# Automatically find the best interpretable model
clf = WhiteBoxBuilder()
clf.fit(X_train, y_train)

# Instant predictions
predictions = clf.predict(X_test)

# See the model
print(wb)
```

Python Library
pip install, scikit-learn compatible

MCP / GenAI
Claude, ChatGPT, Copilot

Data Platforms
Plugins for commercial platforms

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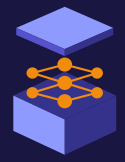
Conclusion

Fully **Explainable AI** Without Sacrificing **Accuracy**

Addressing regulatory requirements for transparency
Enabling trustworthy AI in high-stakes industries

We Are Seeking Pilot Partners
Test our solution with your data



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Selected publications

- **Expressive Power of Graph Transformers via Logic**

  Veeti Ahvonen, Maurice Funk, Damian Heiman, Antti Kuusisto, Carsten Lutz · **AAAI 2026**

- **Logical Characterizations of Recurrent Graph Neural Networks with Reals and Floats**

  Veeti Ahvonen, Damian Heiman, Antti Kuusisto, Carsten Lutz · **NeurIPS 2024**

- **Why This and Not That? A Logic-based Framework for Contrastive Explanations**

  Tobias Geibinger, Reijo Jaakkola, Antti Kuusisto, Xinghan Liu, Miikka Vilander · **JELIA 2025**

- **Explainability via Short Formulas: the Case of Propositional Logic with Implementation**

  Reijo Jaakkola, Tomi Janhunen, Antti Kuusisto, Masood Feyzbakhsh Rankooh, Miikka Vilander · **JAIR 2025**

- **Interpretable Classifiers for Tabular Data via Feature Selection and Discretization**

  Reijo Jaakkola, Tomi Janhunen, Antti Kuusisto, Masood Feyzbakhsh Rankooh, Miikka Vilander · **DAO-XAI 2024**

- **Short Boolean Formulas as Explanations in Practice**

  Reijo Jaakkola, Tomi Janhunen, Antti Kuusisto, Masood Feyzbakhsh Rankooh, Miikka Vilander · **JELIA 2023**

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