

## TECH OFFER

### Building Explainable, Verifiable, Compact & Private Ai Solutions For Critical Applications



## KEY INFORMATION

TECHNOLOGY CATEGORY:  
Infocomm - Artificial Intelligence

TECHNOLOGY READINESS LEVEL (TRL): **TRL4**  
COUNTRY: **SINGAPORE**  
ID NUMBER: **TO174978**

## OVERVIEW

The technology consists in a new type of neural networks, providing explainable, verifiable, compact and private AI solutions.

**Explainability:** the technology provides precise global explanations and the exact rules learned by the AI model, even with large datasets. We transform clients' raw data and/or models into meaningful results through high-quality visual analytics, empowering them to enhance the model based on these explanations.

**Formal Verification:** the technology allows the client to formally verify certain properties of the model, such as its robustness to adversarial attacks, its fairness according to certain features, etc.

## TECHNOLOGY FEATURES & SPECIFICATIONS

Our training and testing processes are fully automated and we are currently developing a client's side software so that users can

train/verify/modify/improve/protect the models themselves. In addition the interface will provide the client a complete explanation of the inference of their models, by providing a set of logical rules that describe exactly the model.

**Compactness/AI for Embedded Systems:** the models resulting from our technology are extremely small, requiring much fewer logical gates and/or latency than other existing solutions, even for large datasets. There are suited for both constrained software and hardware environments.

**Privacy-preserving AI:** Privacy-preserving AI technologies are necessary if you want to protect the data of the client during inference, but they are extremely costly in terms of computation and memory. Using our technology, you can largely reduce this cost and eventually obtain practical privacy-preserving AI solutions for tabular datasets and more.

## POTENTIAL APPLICATIONS

- Banking (credit scoring, customer churn, anti-money laundering, etc.)
- Insurance (claims management, fraud mitigation, etc.)
- Healthcare (clinical workflow, predicting ICU transfers, etc.)
- Data analytics (pricing optimization, etc.) and marketing companies (content personalization, lead scoring, etc.)
- Research teams (DNA, health, environment, energy) and academia
- Autonomous cars (embedded AI)
- Energy (AI for edge computing)
- Security / Military (private, safe, compact, verified AI) and Gov agencies / Customs (responsible, fair AI)
- Manufacturing, logistic, supply chain (predictive maintenance, transportation optimization, etc.)
- Individual users: data analysts, AI professionals

## UNIQUE VALUE PROPOSITION

Our AI models are the first to be optimized to work on encrypted inputs, fully guaranteeing the privacy of the user's data. In particular, we provide the first practical solution of a privacy-preserving AI model for tabular datasets.

Our AI models are very compact and can fit even in tiny microcontrollers (software) or in a very small area (hardware). It can be naturally transformed into a set of logical rules, providing global and exact interpretability of the inference. This would be impossible with current AI models that scale to large datasets.

Our AI models can formally verify if certain properties are present, such as robustness to a certain noise level, fairness, etc.). Again, this is impossible with most AI models, and especially those who scale to large datasets.