

## Shiru presents a better AI approach for protein function prediction at NeurIPS

A novel combination of machine learning approaches results in a new state-of-theart in predicting where proteins go and what they do.

ALAMEDA, CALIFORNIA, UNITED STATES, November 16, 2022 /EINPresswire.com/ -- <u>Shiru</u>, a functional ingredients discovery company, announced today that it will present a new state-of-the-art Al method for predicting protein subcellular localization, with broad implications for food alternative



proteins, health care, pharma, personal care, and more.

The paper, entitled "Improving Protein Subcellular Localization Prediction with Structural

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This new approach enhances our ability to uncover the hidden food functionality of proteins." *Lawrence Lee, Shiru Chief Technology Officer*  Prediction & Graph Neural Networks," will be presented at NeurIPS, the leading conference of the AI research community, on Saturday, December 3, 2022, at the Machine Learning for Structural Biology Workshop.

 Shiru AI researchers present a new state-of-the-art method of predicting protein localization at NeurIPS, the leading conference of the AI research community.
The simple and effective method combines Language

Models (LM) and Graph Neural Networks (GNN) to predict protein subcellular localization — with implications for function prediction.

— Shiru is pioneering its use in discovering highly functional alternative proteins for food, and there's broad application in health care, pharma, personal care, and other fields.

Predicting where a protein localizes or resides in a cell is a huge challenge in biotechnology. Where a protein resides is an important indicator of its function and manufacturability. Many processes, such as disease mechanisms, drug performance, regulation of metabolic processes, and signaling cascades, depend on a protein's localization.

Previous work in the field has shown how Language Models (LM) and Graph Neural Networks (GNN) can independently provide efficient localization predictions when trained on protein DNA sequences and 3D structures, respectively. Shiru Al researchers created a method for combining the two different kinds of protein representations used by LM



and GNN, then used real-world data to show how ensembling them outperforms the reigning state-of-the-art method.

"This paper validates our approach and offers a generalized method that opens new possibilities toward creating a sequence-to-function map of the protein universe," says Geoffroy Dubourg-Felonneau, Shiru's Machine Learning Lead and the paper's lead author. "We are continually developing new and improved methods for protein representation, and we show in this case that the combination of protein structure information and language modeling yields a significant improvement on the task of subcellular localization prediction."

"Shiru is pioneering the use of advanced machine learning techniques to reveal proteins with similar function but dissimilar sequence and structure relative to a target protein," says Lawrence Lee, Shiru's Chief Technology Officer. "This new approach enhances our ability to uncover the hidden food functionality of proteins."

The new AI method is the latest from Shiru's science and technology team. In September 2022, Shiru was awarded a key patent for its protein discovery platform, which covers machine learning combined with lab analysis for developing naturally-occurring proteins as functional food ingredients. Shiru's <u>Flourish</u><sup>™</sup> technology is being proven through partnerships with global food leaders Puratos and CP Kelco. Shiru also recently announced that Impossible Foods veteran Ranjani Varadan joined as Chief Scientific Officer.

## About Shiru:

Shiru is a functional ingredient discovery company on a mission to improve the sustainability of our food system. Shiru uses machine learning and precision fermentation to find and scale naturally-occurring proteins as functional ingredients to replace animal-based alternatives. Shiru's ingredient pipeline is initially focused on gelation, egg replacement, and alternative fats. Founded in 2019, Shiru partners with some of the world's leading ingredient makers to bring delicious, cost-effective, healthy, and sustainable products to market. Shiru is based in Alameda, California, and is backed by leading venture capital firms such as S2G Ventures, Lux Capital, and CPT Capital. Learn about our story at <u>www.shiru.com</u>.

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