To predict the core gut microbial features associated with risk of developing diseases with potential demographic, adiposity, and dietary factors using advanced Deep Learning Algorithms.

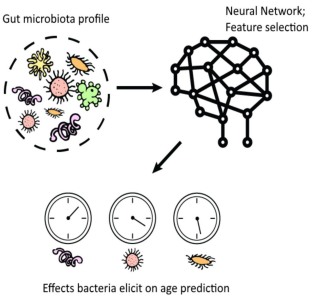
Abstract (300 word limit)

Problem Statement: To predict the core gut microbial features associated with risk of developing diseases with potential demographic, adiposity, and dietary factors using advanced Deep Learning Algorithms.

Research:

Food and human health are inextricably linked. As such, revolutionary impacts on health have been derived from advances in the production and distribution of food relating to food safety and fortification with micronutrients. During the past two decades, it has become apparent that the human microbiome has the potential to modulate health, including in ways that may be related to diet and the composition of specific foods. Despite the excitement and potential surrounding this area, the complexity of the gut microbiome, the chemical composition of food, and their interplay in situ remains a daunting task to fully understand. However, recent advances in high-throughput sequencing, metabolomics profiling, compositional analysis of food, and the emergence of electronic health records provide new sources of data that can contribute to addressing this challenge. Computational science will play an essential role in this effort as it will provide the foundation to integrate these data layers and derive insights capable of revealing and understanding the complex interactions between diet, gut microbiome, and health. Here, we review the current knowledge on diet-health-gut microbiota, relevant data sources, bioinformatics tools, machine learning capabilities, as well as the intellectual property and legislative regulatory landscape. We provide guidance on employing machine learning and data analytics, identify gaps in current methods, and describe new scenarios to be unlocked in the next few years in the context of current knowledge.

Image



Recent Publications (minimum 5)

1. Interpretable Machine Learning Framework Reveals Robust Gut Microbiome Features Associated With Type 2 Diabetes Diabetes Care 2021;44:358–366
2. Predicting Growth and Carcass Traits in Swine Using Microbiome Data and Machine Learning Algorithms - Christian Maltecca, Duc Lu, Constantino Schillebeeckx, Nathan P. McNulty, Clint Schwab, Caleb Shull & Francesco Tiezzi
3. Applications of Machine Learning in Human Microbiome Studies: A Review on Feature Selection, Biomarker Identification, Disease Prediction and Treatment
4. Interpretable machine learning framework reveals novel gut microbiome features in predicting type 2 diabetes Wanglong Gou, Chu-wen Ling, Yan He, Zengliang Jiang, Yuanqing Fu, Fengzhe Xu, Zelei Miao, Ting-yu Sun, Jie-sheng Lin, Hui-lian Zhu, Hongwei Zhou, Yu-ming Chen, View ORCID ProfileJu-Sheng Zheng
5. The Computational Diet: A Review of Computational Methods Across Diet, Microbiome, and Health - Ameen Eetemadi Navneet Rai,2 Beatriz Merchel Piovesan Pereira Minseung Kim, Harold Schmitz, and Ilias Tagkopoulos



Biography (150 word limit)

Swathi Arulguppe Nagendra is the CEO of BetterMeal AI and serves on its board of directors. Before BetterMeal, Swathi was an Artificial Intelligence Educator at Galvanize and was responsible for training many C-level execs, managers and non-tech people to Data Scientists worldwide. Her background in AI and nutritional research is now enabling BetterMeal AI to create strategic partnerships and collaborations that serve multiple customers in the healthcare community. Swathi has also been a nominee of Women In It Data Leader of the Year 2019, FOrbes 30 Under 30 Fellow 2018, Women of the Inspiration Nominee 2021. Swathi also won the Impact Challenge Award for her NGO from Friendship Ambassador Foundation United Nations. Swathi earned a Masters from Syracuse University, where she was a Engineering Management Scholar, and a major in Mathematics.

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Notes/Comments: