Algorithmic Lifestyle Optimization in Personalized Medicine

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ABSTRACT

Researchers at the University of California, Davis have developed an algorithm that uses data from group testing to rapidly provide lifestyle optimizations that improve the health of patients.

FULL DESCRIPTION

Personalized medicine is a growing industry where treatment options are customized based on an individual's specific physiology and medical history. This approach shows particularly promising results in the treatment of chronic medical conditions using personalized diet and exercise recommendations. To make such recommendations, biomarkers are commonly taken through blood or urine samples and analyzed. However, the predictive power of these biomarkers is typically unreliable, resulting in inconclusive treatment recommendations. A more reliable method of personalized medicine is the standard elimination approach, where variables are introduced one at a time to see their immediate impact on an individual's health. While the standard elimination method is more precise, it takes much longer to isolate many compounding variables. For instance, it can take up to a year to determine the impact of food sensitivities on patients with irritable bowel syndrome (IBS) through a standard elimination diet, since only one food group can be tested at a time. Improvements to the standard elimination process of lifestyle interventions can provide patients with effective, personalized treatment options more quickly.

Researchers at the University of California Davis have developed an algorithmic lifestyle optimization (ALO) tool that analyzes data from a group of patients to expedite the standard elimination approach and quickly identify optimal lifestyle interventions. By utilizing a collection of data that is influenced by multiple variables, it is possible to analyze a variety of treatment options more quickly. After this data is collected, it then undergoes iterative computations until an optimal treatment is discovered. The ALO tool has shown promising results by creating dietary recommendations based on realistic datasets. Using these datasets, it is estimated that ALO can predict information about food sensitivities in patients with IBS around 60% faster than testing with the standard elimination diet. The accuracy of the standard elimination approach still applies, but conclusive results can be found much more quickly by means of group testing. The time saved using this approach can be beneficial in improving patients' health and may allow personalized medicine to become more accessible in the future.

APPLICATIONS

- Treatment of chronic medical conditions through personalized lifestyle interventions.
- Personalized diet and nutrition recommendations.

FEATURES/BENEFITS

- More reliable than biomarker-based analysis in personalized medicine.
- Discovers optimal treatment options up to 60% faster than standard elimination approach.
- Supports personalized nutrition, wellness, and chronic disease management strategies.

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Published Application	20250046415	02/06/2025	2022-529
United States Of America	Published Application	20250029698	01/23/2025	2022-529

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- EyeCV: A Novel Tool for Rapid, Accurate, and Reproducible Screening of Endothelial Cell Morphology in Diseased and Healthy Corneas

INVENTORS

- Eetemadi, Ameen
- Tagkopoulos, Ilias

OTHER INFORMATION

KEYWORDS

personalized nutrition, group testing, diet recommendation, optimization, diet

CATEGORIZED AS

- **Biotechnology**
  - Bioinformatics
  - Health
- **Medical**
  - Diagnostics
  - Research Tools
  - Screening
  - Software
  - Therapeutics

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