UC DAVIS
Innovation Institute
for Food and Health

Faculty Collaboration Spotlight

Dr. Ilias Tagkopoulos

Ilias Tagkopoulos
Professor, Artificial Intelligence, UC Davis; Director, USDA/NSF AI Institute For Next Generation Food Systems

AIFS
AI INSTITUTE FOR FOOD SYSTEMS

Introduction

At the Innovation Institute for Food and Health (IIFH), we are proud to collaborate with Dr. Ilias Tagkopoulos, Director of the Artificial Intelligence Institute for Next Generation Food Systems (AIFS), to tackle critical challenges in the food system. By integrating artificial intelligence with interdisciplinary expertise, Dr. Tagkopoulos helps us advance our mission to create healthier, more sustainable, and accessible food options. His groundbreaking work uses AI to accelerate innovation and improve productivity, delivering solutions that benefit both businesses and consumers.

Through our collaborative research with Dr. Tagkopoulos and other UC Davis faculty, we address diverse challenges, such as developing sustainable sugar substitutes, enhancing fiber-rich foods, improving protein bioavailability, and extending the shelf life of healthier products. These projects bridge academic research with industry needs, transforming the food system to promote health and sustainability.

From Sick Care to Health Care

Dr. Tagkopoulos' journey into the food sector began with his interest in sustainability and human health. A dissertation on GMO risk reduction coupled with his background as a fellow at an environmental institute shaped his understanding of the molecular basis of food and its interaction with human physiology. He emphasized that while pharmaceuticals address illness, ***food can prevent chronic diseases*** like hypertension and inflammation before they manifest. "Instead of sick care, we need health care," he remarked.

Resources

FoodAtlas
An expanding knowledge graph that aims to capture comprehensive relationships between foods and other entities, including chemicals and diseases.

Publications

FoodAtlas: Automated knowledge extraction of food and chemicals from literature

Artificial intelligence in food and nutrition evidence: The challenges and opportunities

However, he acknowledged the challenge of adherence to healthier diets. Many individuals resist changing their eating habits if it diminishes their enjoyment of life. Dr. Tagkopoulos highlighted the importance of creating food choices that are both healthy and delicious, citing companies like Rivalz as examples.

> "AI plays a pivotal role in this transformation by accelerating innovation and improving productivity. It enables the efficient development of solutions that blend taste, nutrition, and affordability." - **Dr. Ilias Tagkopoulos**

Why UC Davis?

Dr. Tagkopoulos' academic journey took him from Greece to Columbia University before he chose UC Davis. He was drawn to Davis' unique combination of positive energy, diverse research opportunities, and collaborative culture. "The culture here was very collegiate," he reflects.

In 2008, UC Davis provided him with a rare dual setup—both a computational and experimental lab—an opportunity still uncommon for AI experts. This environment has enabled groundbreaking work integrating AI with experimental research.

Bringing AI & Food + Health Innovation Together

At IIFH, we collaborate extensively with Dr. Tagkopoulos and his lab on many of our interdisciplinary research projects. Together, we aim to create new, healthier products that taste great, improve the health profile of existing products, and explore innovative areas of food-for-health research that are good for people and the planet. Past projects have included developing less expensive methods to produce healthier and more sustainable sugar substitutes, creating fiber-rich foods that retain great taste, enhancing protein bioavailability, and discovering ways to extend the shelf life of healthier foods. These efforts draw on expertise spanning protein engineering, AI, food science, chemistry, biology, and more.

Dr. Tagkopoulos also leads AIFS, a testament to the collaborative ethos of UC Davis. AIFS brings together over 40 researchers from institutions such as UC Berkeley, Cornell University, and the U.S. Department of Agriculture, integrating disciplines across the entire food system—from farm to fork—using AI as the connective tissue. Funded by the USDA's National Institute of Food and Agriculture, the institute's mission aligns with a larger initiative to leverage AI for societal and environmental transformation.

AIFS' efforts extend beyond research. It includes outreach to policymakers, stakeholders, and farmers, as well as education initiatives that fund undergraduate and graduate students. Programs like cross-campus learning, hackathons, and career development workshops are key components of its strategy.

Envisioning the Future

When we asked Dr. Tagkopoulos about the future, he shared his vision for a transformed food system:

- **Good for people:** Nutrient-rich, delicious, and affordable options.
- **Good for the planet:** Sustainable production practices that optimize natural resources and minimize environmental impact.
- **Accessible:** A food system designed to ensure equitable access to nutritious options.

Our partnership with Dr. Tagkopoulos exemplifies how collaboration can harness AI to advance innovation and improve productivity in the food system. By integrating cutting-edge research with industry needs, we focus on creating delicious, nutritious, and affordable food options for everyone. Together, we aim to transform the way food is produced, distributed, and consumed, ensuring a healthier future for people and the planet.