Can AI Design Culturally Aligned Dietary Recommendations for Ethnic Populations?

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Nutritional guidelines and dietary recommendations, often based on Western foods, may lack cultural relevance and accessibility for non-Western regions. Central Asian diets, which rely on traditional foods and ingredients that differ significantly from those in Western contexts, require tailored dietary guidance to promote practices which are applicable to the population. Culturally adapting nutritional recommendations can make dietary advice more practical and effective for Central Asian populations.

This pilot study aims to develop an AI-driven dietary recommendation system that modifies Western nutritional guidance to align with Central Asian dietary practices. By suggesting culturally relevant alternatives for commonly recommended Western ingredients, the model adapts dietary advice to local food preferences and availability. For example, instead of recommending quinoa or cous cous, the model suggests local grains with similar nutritional profiles that are more familiar and accessible in Central Asia. Based on 15 simulated patient cases, we curated a dataset of Western dietary recommendations alongside nutrient-rich Central Asian ingredients, web-scrapping open data resources databases to identify nutritional profiles for each food. A large language model (LLM) was fine-tuned on this dataset to generate culturally adapted recommendations. Given dietary goals such as "healthy breakfast" or Western foods as input, the LLM outputs equivalent Central Asian dishes or ingredients based on similar

nutritional attributes. The model's performance will be evaluated based on user feedback, with an emphasis on the relevance, practicality, and cultural alignment of the dietary recommendations, using a 5-point Likert scale.

This culturally adaptive AI framework demonstrates the potential to decolonize nutritional guidance by aligning dietary recommendations with regional foods. By integrating nutritional science with cultural context, the system provides accessible, relevant dietary advice that promotes health in ways that respect and preserve traditional dietary practices. Full implementation details and sample recommendations will be presented at the Summit, showcasing the model's adaptability to non-Western dietary needs.