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Multi-Factor based Nutrient Management and Recipe Recommendation System

Submitted to
Dr. Shilpa Shashikant Chaudhari

TEAM MEMBERS

Sl. No	USN	Name
1.	1MS18CS025	ARAVIND SHREYAS RAMESH
2.	1MS18CS040	DHEERAJ BHAT
3.	1MS18CS043	DIVYA
4.	1MS18CS046	GAURAV V

Literature Survey

Reference	Year	Proposed Work	Results/Observations
[1]	2013	Personalized Ubiquitous Diet Plan Service Based on Ontology and Web Services	As computers have become more popular and with the exponential rise in the context of the technical industry, there has been an increase in the number of people who are using computers. As a result of the tremendous development in the use of IT, the landscape around health awareness, living practices, and consumer behaviors has changed dramatically. In the meantime, demand continues to grow for information- and knowledge-based healthcare services. People have begun to pay attention to their health and well-being as a result of this. The goal of this study was to create and test an ontology-based system for dietary recommendations based on standard health-level-seven (HL7) data from medical screening. The system makes intelligent recommendations leveraging a web-based platform for its users. The system was built to generate diet plans by eliminating unsuitable food groups based on the user's priorities.
[2]	2021	Food recommendation with graph convolutional network	Web-based services have revolutionized the way information is consumed. Dietary recommendation systems have attracted not just end consumers but also several food-related applications and services. Said systems aim to match the preferences of a user to a recipe. Several systems have

			been utilized ranging from content-based and collaborative filtering to evolved and sophisticated methods. A novel system that utilizes Graph Convolutional Network (GCN) that exploits ingredient-ingredient-recipe-user cross-relations deeply. It leverages an information propagation mechanism and adopts multiple embedding propagation layers to model high-order connectivity across multiple food-based relations to enhance representation. 3 unique propagation systems from a permutation of ingredient-user-recipe states. In-depth analysis shows that the GCN-based model could reduce the scarcity of elite systems in the context of food recommendations.
[3]	2014	The nature and evolution of online food preferences	Food consumption plays a central role in human race survival. Food preferences have manifested themselves as social, cultural, and economic forces. Historically, recorded data for food preparation, preferences, and consumption patterns collected from households and individuals have played a huge role in realizing systems to recommend recipes and diets to users. The publication in consideration aims to scrape useful data from the world wide web and analyze its usefulness in food recommendations and patterns. The important conclusions of the experiment are the correlation between recipes and ingredients, differences between regional ingredients, and the variation of preferences based on the time frame.

[4]	2015	Temporal Patterns in Online Food Innovation	The role of innovation in food preferences and preparation has in the context of food-based careers, be it recommender engines, chefs to even packed food producers has stood the wrath of time. The experiment aims to explore the dimension of innovation in a virtual format. To be more precise, it talks about the processed results from a large-scale German online food community platform to explore the use case of online food recipe production. The results bring about the findings and temporal patterns in how online food recipe innovation takes place.
[5]	2018	Automated and Personalized Nutrition Health Assessment, Recommendation, and Progress Evaluation using Fuzzy Reasoning	People's lives have grown increasingly focused on living a healthy lifestyle. The latter necessitates maintaining a healthy diet while taking into account the types and amounts of foods consumed. It also calls for leading an active lifestyle that includes adequate physical activity in order to control calorie and nutrient intake and consumption. As a result, people seek out nutrition specialists to conduct health assessments, which are costly, time-consuming, and difficult to come by. Despite the fact that a variety of e-nutrition solutions have been developed, the majority of them focus on meal planning rather than health assessment or evaluation (traditionally provided by human experts). This research aims to provide an automated solution for performing nutritional health assessments, recommendations, and progress evaluations. A novel framework titled PIN was tested which is based on the fuzzy logic paradigm to simulate human expert health assessment capabilities including

			weight, calorie consumption, age, exercise patterns, and height. The results quantify PIN's assessment and recommendations on par with human nutritionists.
[6]	2011	Hierarchical Attention Network for Visually-aware Food Recommendation	Food recommender systems are useful in guiding users in identifying the foods they want to eat. Deciding what to eat is a complicated and multi-faceted process that is influenced by a variety of elements including the ingredients, the appearance of the recipe, the user's personal food preferences, and multiple contexts such as previous meals. The authors formulate the meal recommendation problem in this paper as predicting user preference for recipes based on three major aspects that influence a user's food choice: 1) the user's (and other users') history; 2) the contents of a dish, and 3) the recipe's descriptive image. To tackle this difficult problem, the authors created Hierarchical Attention-based Food Recommendation (HAFR), a dedicated neural network-based solution capable of 1) capturing the collaborative filtering effect, such as what similar users eat; 2) inferring a user's preference for the ingredient level; and 3) learning user preference from the recipe's visual images. The authors create a large-scale dataset with millions of reviews from AllRecipes.com to test our proposed technique. Extensive tests demonstrate that our system outperforms many competing recommender solutions, such as Factorization Machine and Visual Bayesian Personalized Ranking, by an average of 12%, indicating that it can accurately predict user food preferences.

			After acceptance, the codes and dataset will be made public.
[7]	2016	Artificial Bee Colony – Based for Dietary Recommendation in Daily Nutrition Requirements	A healthy lifestyle is a must for people, which may be attained through balanced nutrition. Unbalanced nutrition raises the chance of health issues. The disparity between nutrition required and nutrition consumed must be as little as feasible in order to achieve balanced nutrition. In Indonesia, many people consume high-carbohydrate foods, despite the fact that nutrition consists of protein, carbohydrate, and fat. That nourishment comes from five types of foods: main dish (MP), vegetable side dish (LN), meat (LH), vegetable (SY), and fruit (F) (BH). As a result, it requires a system that can make recommendations for healthy eating. The Artificial Bee Colony (ABC) was employed in this study to obtain optimal nutrition, which has five dimensions (MP, LH, LN, SY, BH). Food sources are represented by these dimensions and variables, which will be optimized by bees. The study's key contribution is to determine the best portion and type of food to reach the best solution, which is to make food recommendations for Indonesian cuisine. The best solution comes from fitness function, which is the difference between the nutrition required and the nutrition recommended. This study proposes an artificial bee colony algorithm for determining the amount and type of food required for daily nourishment. ABC can give acceptable portions and types of foods with an error tolerance of 80 percent to 110 percent and an average accuracy of 99.90 percent.

[8]	2013	You are what you eat: learning user tastes for rating prediction	Poor nutrition is one of the leading causes of illness and death in the Western world, and it is driven by a number of factors such as a lack of nutritional knowledge and a preference for convenience meals. We want to create systems that can offer healthy meal plans to consumers, but one of the most important requirements is the ability to recommend dishes that people would enjoy. By analyzing the findings of a longitudinal study (n=124), we analyze critical aspects that influence how recipes are assessed in order to better understand how to tackle the suggestion challenge. A number of critical contextual aspects that can influence the rating decision are identified. We build numerous recipe suggestion models based on this study that can utilize information of user preferences in terms of ingredients and combinations of ingredients, as well as nutritional content. We can show that these models can dramatically outperform a number of competing baselines using an experiment on our dataset.
[9]	2018	Enhancing multi-label classification for food truck recommendation	Food trucks are a popular fast food restaurant alternative that are distinguished by their close proximity to customers. Their success has prompted a growth of available options, which currently comprise several distinct types of cuisines, making consumer selection a difficult task. This work focuses on the subject of food truck suggestion using a multi-label technique, based on data acquired from a market research in which hundreds of participants submitted their food truck preferences.

			It focuses on how to improve the recommendation task in the context of a previous study in which some labels were never predicted. Various options were considered in order to address this issue. One of these options, the Ensemble of Single Label proposed in this study, was successful in lowering it. When they were applied in the researched task, they produced good predictive results despite their simplicity. All labels were successfully predicted on at least a few occasions, among other advantages.
[10]	2019	The Effectiveness of Nutrition Education about Local Specific Food-based Balanced Nutrition Recommendation on Dietary Intake Level and Anemia Status in Female Adolescents	Anemia is the most serious dietary issue among adolescents. Poor diet is one of the key risk factors. Nutrition education has been found to increase healthy lifestyles and academic achievement in school-aged children when used as an intervention technique. The goal of this study was to see how effective nutrition education about local food-based balanced nutrition recommendations affected female adolescent knowledge, dietary intake, and anemia status. This was a quasi-experimental study that included a pre and post-test design. Eighty-three female pupils took part in the study for five months. Nutrition instruction in the form of classroom counselling on balanced dietary guidelines and healthy snacks was provided. Before and after the intervention, dietary consumption, knowledge, and haemoglobin levels were examined. The paired t-test and Wilcoxon signed-rank test were used to analyse the data, with $p<0.05$ considered significant. There was a significant difference in

			protein (p=0.029) and iron consumption (p=0.021) intake levels before and after the intervention, but not in vitamin C or folic acid intake. Increased knowledge, dietary intake (protein and iron), and hemoglobin levels in female teenagers can be achieved through nutrition education regarding local specific food-based balanced nutrition recommendations.
[11]	2021	Food recommendation system for the elderly	When the elderly sit down to eat, they frequently struggle to select nutritious foods. Normally, they choose their own food or have a caregiver assist them in finding a menu or arranging the dishes they want to consume. However, food preparation for the elderly differs from that for other ages because it necessitates careful consideration of health and proportions appropriate for their age. It also implies that more caution is required. The creation of a meal recommendation system for the elderly has as its goal the introduction of healthy diets and the promotion of good health among the elderly. This system employs approaches that aid in menu recommendations, allowing the elderly to make more informed eating choices. As a result, a suitable food recommendation system is being developed by using Clustering Algorithm analysis techniques to divide the elderly into groups based on their behaviors, eating habits, and food preferences, and using the Slope One Algorithm, which can predict menu-preference scores, as a technique to provide food suggestions. Furthermore, the calculating procedure has been enhanced to make it more useful in order

			to improve the application's quality and the accuracy of food recommendations: The Root Mean Square Error (RMSE) is utilized in forecasting and recommending appropriate menus for each elderly person, and it can be used to develop the application system to satisfy the users' needs so that they can choose healthy diets for their loved ones.
[12]	2019	Patient Diet Recommendation System Using K Clique and Deep learning	There are a few frameworks intended to suggest this. The suggesting framework has acquired its conspicuousness even in the clinical business for recommending the weight control plans for the patient's, meds to be taken, medicines to be taken and so on. The suggestion framework for the most part upgrades the vigor, broadens insurance against the numerous illnesses and works on the nature of living. So to naturally recommend the food sources in light of their medical issue and the degree of sugar, pulse, protein, fat, cholesterol, age and so on, the paper advances the k-clique embedded deep learning classifier recommendation system for suggesting diets for the patients. The K-clique embedded deep learning classifier in the proposal framework in a work of getting a further developed accuracy and expanded the precision of the profound learning classifier (gated repetitive units). The dataset for the observational examination of the created framework was performed with the informational index of the patients gathered over the web as well as emergency clinics; data of around 50 patients were gathered with thirteen elements of different infection and

			thousand items with eight lists of capabilities. This large number of elements were encoded and assembled into a few bunches prior to applying them into the profound learning classifiers. The better accuracy and the exactness noticed for the created framework tentatively is contrasted and the AI methods, for example, strategic relapse and Naïve Bayes and other profound learning classifiers, for example, the MLP and RNN to illustrate the capability of the K-Clique deep learning classifier based proposal framework (K-DLRS).
[13]	2019	The Cholesterol Factor: Balancing Accuracy and Health in Recipe Recommendation Through a Nutrient-Specific Metric	Many food recommender systems optimize for users' preferences, health is another but often overlooked objective. This paper aims to recommend relevant recipes that avoid nutrients that contribute to high levels of cholesterol, such as saturated fat and sugar. The author introduced a novel metric called 'The Cholesterol Factor', based on nutritional guidelines from the Norwegian Directorate of Health, that can balance accuracy and health through linear re-weighing. The author tested popular recommender approaches by evaluating a recipe dataset from AllRecipes.com, in which a CF-based SVD method outperformed content-based and hybrid methods. Although the author found that increasing the healthiness of a recommended recipe set came at the cost of Precision and Recall metrics, only putting little weight (10-15%) on our Cholesterol Factor can significantly improve the healthiness of a

			recommendation set with minimal accuracy losses.
[14]	2017	A Cross-Sectional Survey in Rural Bihar, India, Indicates That Nutritional Status, Diet, and Stimulation Are Associated with Motor and Mental Development in Young Children	The goals of this study were to look at the nutritional, psychological, environmental, and household determinants of child development in Bihar, India, as well as to discover mediators between dietary diversity and mental development. They surveyed 4360 households with children aged 6–18 months in Bihar's West Champaran area using two stages of cluster randomized sampling. One of the most important findings was that gross motor development and fine motor development were major mediators in the relationship between dietary diversity and mental development.
[15]	2011	A Personalized Recipe Advice System to Promote Healthful Choices	The article presents a prototype of a personalized recipe guidance system that assists users in making health-conscious meal choices based on previous choices. A goal setting mechanism is used in conjunction with tailored recipe ideas to encourage the adoption of a healthy lifestyle. The app's major focus is on selecting appropriate recipes for future meals, with no feedback on previous choices provided.
[16]	2021	Deriving a Recipe Similarity Measure for Recommending Healthful Meals	In the past decades, the process of urbanization has shaped general socio-economic aspects of cities with different population sizes. Among them, food consumption is a good indicator to read the quality of life. In this paper, the authors study the impact of city size on food preferences, as shown by users of a large German food sharing

			community. The authors quantitatively and qualitatively analyze differences in dietary choices made by users who indicate they live in cities of different sizes, from metropolises and big cities to medium and small towns. Further, the authors demonstrate that the city size of the creatorsIn the past decades, the process of urbanization has shaped general socio-economic aspects of cities with different population sizes. Among them, food consumption is a good indicator to read the quality of life. In this paper, the authors study the impact of city size on food preferences, as shown by users of a large German food sharing community. the authors quantitatively and qualitatively analyze differences in dietary choices made by users who indicate to live in cities of different sizes, from metropolises and big cities to medium and small towns. Further, the authors demonstrate that the city size of the creators of online recipes can be predicted with a good accuracy of 86%, using predictors based on recipe authors' roles, recipe popularity, season, and recipe complexity and contents. Endings indicate that city size is a useful feature to take into account in various other domains of online recipes that can be predicted with a good accuracy of 86%, using predictors based on recipe authors' roles, recipe popularity, season, and recipe complexity and contents. endings indicate that city size is a useful feature to take into account in various other domains.

[17]	2012	A Food Recipe Sourcing and Recommendation System to Minimize Food Miles	Supportable Recipes is an instrument that (1) interfaces food plans fixing records with the nearest natural suppliers to limit the distance that food goes from homestead to food readiness site and (2) suggests plans given a GPS direction to limit food miles. Maintainable Recipes gives purchasers, business visionaries, cooking lovers, and waiters in the United States and somewhere else with a simple to utilize point of interaction to help them associate with natural fixing makers to source fixings to deliver food plans, limiting food miles and suggesting plans utilizing privately developed food. The super scholarly commitment of Sustainable Recipes is to overcome any issues between two floods of writing in information study of food plans, investigations of food plans and investigations of food supply chains. The results of the interphase are: (1) a guide perception that features the area of the makers that can supply the elements for a food formula alongside a ticket consisting of their contact addresses and the food miles used to create a formula and (2) A rundown of plans that limit food miles for a given GPS coordinate in which the formula will be delivered.
[18]	2018	Recipe recommendation using ingredient networks	Sustainable Recipes is a tool that connects food recipe ingredient lists with the closest organic providers to minimize the distance that food travels from farm to food preparation site and recommends recipes given a GPS coordinate to

			minimize food miles. Sustainable Recipes provides consumers, entrepreneurs, cooking enthusiasts, and food chains in the United States and elsewhere with an easy to use interface to help the connect with organic ingredient producers to source ingredients to produce food recipes minimizing food miles and recommend recipes using locally grown food. The main academic contribution of Sustainable Recipes is to bridge the gap between two streams of literature in data science of food recipes: studies of food recipes and studies of food supply chains. The outcomes of the interphase are a map visualization that highlights the location of the producers that can supply the ingredients for a food recipe along with a ticket consisting of their contact addresses and the food miles used to produce a recipe an a list of recipes that minimize food miles for a given GPS coordinate in which the recipe is going to be produced.
[19]	2021	Personalized Food Recommendation as Constrained Question Answering over a Large-scale Food Knowledge Graph	The research introduces a unique problem formulation for food recommendation, describing the task as constrained question responding across a large-scale food knowledge base/graph (KBQA). Addressing shortcomings such as i) failing to consider users' explicit requests, ii) ignoring critical health concerns (e.g., allergies and nutrition needs), and iii) failing to employ rich food knowledge for recommending healthy recipes, They develop a dataset in the QA manner for personalized food suggestions. The benchmark results reveal that the technique beats non-personalized counterparts (average 59.7 percent

			absolute improvement across multiple evaluation parameters) and can offer more relevant and healthier recipes.
[20]	2011	The Influence of City Size on Dietary Choices	In the previous many years, the course of urbanization has molded general financial parts of urban communities with different population sizes. Among them, food utilization is a decent marker to read personal satisfaction. In this paper, the authors concentrate on the effect of city size on food inclinations, as shown by clients of a huge German food sharing local area. The authors quantitatively and subjectively dissect differences in dietary decisions made by clients who demonstrate living in urban communities of different sizes, from cities and huge urban communities to medium and little towns. Further, the authors show that the city size of the makers of online plans can be anticipated with a decent precision of 86%, utilizing indicators in light of formula creators' roles, formula prevalence, season and formula intricacy and items. Endings show that city size is a valuable element to consider in different other areas.
[21]	2015	Food Recommendation System Using Clustering Analysis for Diabetic Patients	Food and nutrition are key to having good health. They are important for everyone to maintain a healthy diet especially for diabetic patients who have several limitations.Nutrition therapy is a major solution to prevent, manage and control diabetes by managing the nutrition based on the belief that food provides vital medicine and maintains good health. Typically, diabetic patients need to avoid additional sugar and fat so the food

			pyramid is recommended to the patients for finding the substitution from the same food group. However, there is still a dietary diversity within food groups that can affect the diabetic patients. In this study, the authors proposed Food Recommendation System (FRS) by using food clustering analysis for diabetic patients. Our system will recommend the proper substitute foods in the context of nutrition and food characteristics. the authors used Self-Organizing Map (SOM) and K-mean clustering for food clustering analysis which is based on the similarity of eight significant nutrients for diabetic patients. In the end, the FRS was evaluated by nutritionists and it has performed very well and is useful for the nutrition space.
[22]	2015	Using Tags and Latent Factors in a Food Recommender System	The offered suggestions are derived by using a data collection of users' preferences expressed in the form of ratings and tags, which signify the food's components or aspects that the consumers enjoy. Our empirical evaluation demonstrates that the suggested recommendation approach greatly outperforms state-of-the-art algorithms. the authors discovered that adding tags in meal recommendation algorithms may greatly improve prediction accuracy, i.e., the match of anticipated preferences with the genuine user's chosen dishes. Furthermore, our user survey demonstrates that our system prototype is highly usable.

[23]	2017	Investigating the Healthiness of Internet-Sourced Recipes	Researchers demonstrate how algorithmic solutions relate to the healthiness of the underlying recipe collection by focusing on two techniques from the literature (single item and daily meal plan suggestion) and leveraging a huge Internet derived dataset from Allrecipes.com. First, they assess the nutritional value of Allrecipes.com recipes using World Health Organization and United Kingdom Food Criteria Agency nutritional standards. Second, they look into user engagement patterns and how they relate to the nutritional value of dishes. Third, they test both recommendation techniques. The results show that, on average, the recipes in the collection are highly harmful, but this differs across the website's categories.
[24]	2019	Food Recommendation: Framework, Existing Solutions and Challenges	This article provides a unified framework for food recommendation and discusses key difficulties impacting food recommendation, such as merging different context and domain information, developing a personal model, and examining unique food attributes. The author then goes through known solutions to these problems before elaborating on research obstacles and future prospects in this subject. According to the author, this is the first survey that focuses on the study of food suggestion in the multimedia sector, and it provides a collection of research papers and technologies to help researchers in this field.

[25]	2010	Intelligent Food Planning: Personalized Recipe Recommendation	The author offers early research into the design of a recipe recommender aiming at educating and sustaining user engagement and making personalized recommendations of healthy dishes. They focus on the first two dimensions of food recommendations: data gathering and food-recipe interactions, and offer research on the applicability of several recommender algorithms for recipe suggestion.

References

1. Chuan-Jun Su, Yin-An Chen, and Chia-Wen Chih. (2013). Personalized Ubiquitous Diet Plan service based on ontology and web services. http://www.ijiet.org/papers/329-K012.pdf

2. Gao, Xiaooyan & Feng, Fuli & Huang, Heyan & Mao, Xian-Ling & Lan, Tian & Chi, Zewen. (2021). Food Recommendation with Graph Convolutional Network. Information Sciences. 584. 10.1016/j.ins.2021.10.040.

3. Wagner, Claudia & Singer, Philipp & Strohmaier, Markus. (2014). The nature and evolution of online food preferences. EPJ Data Science. 3. 10.1140/epjds/s13688-014-0036-7.

4. Kusmierczyk, Tomasz & Trattner, Christoph & Nørvåg, Kjetil. (2015). Temporal Patterns in Online Food Innovation. 10.1145/2740908.2741700.

5. Salloum, George & Tekli, Joe. (2021). Automated and Personalized Nutrition Health Assessment, Recommendation, and Progress Evaluation using Fuzzy Reasoning. International Journal of Human-Computer Studies. 151. 102610. 10.1016/j.ijhcs.2021.102610.

6. Gao, Xiaooyan & Feng, Fuli & He, Xiangnan & Huang, Heyan & Guan, Xinyu & Feng, Chong & Ming, Zhaoyan & Chua, Tat-Seng. (2019). Hierarchical Attention Network for Visually-Aware Food Recommendation. IEEE Transactions on Multimedia. PP. 1-1. 10.1109/TMM.2019.2945180.

7. Tanzil, Fidelson & Wulandhari, Lili & M. Isa, Sani. (2016). Artificial Bee Colony — Based for dietary recommendation in daily nutrition requirements. 1-6. 10.1109/KICSS.2016.7951406.

8. Harvey, Morgan & Ludwig, Bernd & Elsweiler, David. (2013). You Are What You Eat: Learning User Tastes for Rating Prediction. 8214. 153-164. 10.1007/978-3-319-02432-5_19.

9. Rivolli, Adriano & Parker, Larissa & de Carvalho, Andre. (2017). Food Truck Recommendation Using Multi-label Classification. 585-596. 10.1007/978-3-319-65340-2_48.

10. Mustafa, Annasari & Maulidiana, Annisa. (2019). The Effectiveness of Nutrition Education about Local Specific Food-based Balanced Nutrition Recommendation on Dietary Intake Level and Anemia Status in Female Adolescents at the Hidayatullah

Arrohmah Islamic Boarding School Malang. KnE Life Sciences. 10.18502/kls.v4i15.5730.

11. Bundasak, Supaporn & Yoksuriyan, Prasopchok & Kuntawee, Patipan & Kotama, Rahat. (2021). Food recommendation system for the elderly. 18. 152-167.

12. Manoharan, Samuel & Ammayappan, Sathesh. (2020). Patient Diet Recommendation System Using K Clique and Deep learning Classifiers. 121-130.

13. Starke, Alain & Trattner, Christoph & Bakken, Hedda & Johannessen, Martin & Solberg, Vegard. (2021). The cholesterol factor : Balancing accuracy and health in recipe recommendation through a nutrient-specific metric.

14. Larson, Leila & Young, Melissa & Ramakrishnan, Usha & Webb-Girard, Aimee & Verma, Pankaj & Chaudhuri, Indrajit & Srikantiah, Sridhar & Martorell, Reynaldo. (2017). A Cross-Sectional Survey in Rural Bihar, India, Indicates That Nutritional Status, Diet, and Stimulation Are Associated with Motor and Mental Development in Young Children. The Journal of Nutrition. 147. jn251231. 10.3945/jn.117.251231.

15. Geleijnse, Gijs & Nachtigall, Peggy & Kaam, Pim & Wijgergangs, Luciënne. (2011). A personalized recipe advice system to promote healthful choices. 437-438. 10.1145/1943403.1943487.

16. Pinxteren, Youri & Geleijnse, Gijs & Kamsteeg, Paul. (2011). Deriving a recipe similarity measure for recommending healthful meals. 105-114. 10.1145/1943403.1943422.

17. Herrera, Juan. (2020). Sustainable Recipes. A Food Recipe Sourcing and Recommendation System to Minimize Food Miles.

18. Chun-Yuen Teng, Yu-Ru Lin, and Lada A. Adamic. 2012. Recipe recommendation using ingredient networks. In Proceedings of the 4th Annual ACM Web Science Conference (WebSci '12). Association for Computing Machinery, New York, NY, USA, 298–307. https://doi.org/10.1145/2380718.2380757

19. Chen, Yu & Subburathinam, Ananya & Chen, Ching-Hua & Zaki, Mohammed. (2021). Personalized Food Recommendation as Constrained Question Answering over a Large-scale Food Knowledge Graph.

20. Hao Cheng, Markus Rokicki, and Eelco Herder. 2017. The Influence of City Size on Dietary Choices. In Adjunct Publication of the 25th Conference on User Modeling, Adaptation and Personalization (UMAP '17). Association for Computing Machinery, New York, NY, USA, 231–236. https://doi.org/10.1145/3099023.3099058

21. Phanich, Maiyaporn & Pholkul, Phathrajarin & Phimoltares, Suphakant. (2010). Food Recommendation System Using Clustering Analysis for Diabetic Patients. 2010

International Conference on Information Science and Applications, ICISA 2010. 10.1109/ICISA.2010.5480416.

22. Mouzhi Ge, Mehdi Elahi, Ignacio Fernaández-Tobías, Francesco Ricci, and David Massimo. 2015. Using Tags and Latent Factors in a Food Recommender System. In Proceedings of the 5th International Conference on Digital Health 2015 (DH '15). Association for Computing Machinery, New York, NY, USA, 105–112. https://doi.org/10.1145/2750511.2750528

23. Trattner, Christoph & Elsweiler, David. (2017). Investigating the Healthiness of Internet-Sourced Recipes Implications for Meal Planning and Recommender Systems. 10.1145/3038912.3052573.

24. Min, Weiqing & Jiang, Shuqiang & Jain, Ramesh. (2019). Food Recommendation: Framework, Existing Solutions and Challenges. IEEE Transactions on Multimedia. PP. 1-1. 10.1109/TMM.2019.2958761.

25. Freyne, Jill & Berkovsky, Shlomo. (2010). Intelligent food planning: personalized recipe recommendation. 321-324. 10.1145/1719970.1720021.