SUBJECTS TO BE COVERED IN TRAINING: FOOD ANALYTICS AND DATA SCIENCE

Shermatova Muhayyo
Andijan State University
1st year master's student, Biology

Annotation: *This article provides information on food products and statistics on this. Also recorded healthy life and attention to it, database*

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Data is everywhere: from sensors and trackers to apps that measure people's behaviour. The use of data science offers new opportunities in the domains of health, nutrition, lifestyle, and consumer behaviour. Over the course of this master's programme you will learn how to integrate these domains to address complex food and health questions using data science.

Interdisciplinary programme that integrates data science knowledge and skills with knowledge about nutrition, consumer behaviour and lifestyles, and their effects on human health. Learn to translate data from diverse sources into intelligible and actionable knowledge, using advanced data processing and analytical methods. Construct your own learning pathway based on your interest and learn how to give direction to your personal and professional development. Get the Data Science for Food and Health Brochure. Study programme of MSc Data Science for Food and Health

The Master's programme Data Science for Food and Health focuses on training individuals as "bridge builders" who specialise in applying statistical and analytical methods to various domains, including human health and nutrition, consumption and healthy lifestyles, food technology, and marketing and consumer behaviour.

What sets this programme apart is that it is suitable for both students with a domain related background and students with a data science background. Students with a domain related background will learn the entire data science process, acquiring the necessary skills and knowledge along the way. On the other hand, students with a data science background will deepen their domain knowledge by taking more intermediate and advanced domain-related courses. For a general overview of the programme and detailed information about courses, internships, and the thesis, please refer to the Data Science for Food and Health page. Even though there are no pre-defined specialisations in this master programme, there are several tracks that students can follow. The tracks are explained below: Nutrition and health: In the field of nutrition and health, large amounts of data, such as data from health trackers or extensive epidemiological studies, are becoming more common. In this track, you will learn to use data science to analyse these data to answer complex questions related to the field of nutrition and health. Consumer

behaviour: in the consumer behaviour track, you will learn to analyse complex marketing and consumer behaviour data. For example, using data science to analyse eye-gazing behaviour, integrate purchasing patterns with demographic data, or develop food recommendation systems using AI.

Lifestyle and health: in the track lifestyle and health, there are two sub-tracks: data science for healthy lifestyles and data science for population health. Data science for healthy lifestyles: In this track, you will work towards understanding and enabling healthy and sustainable consumption and lifestyles. You will learn about health behaviours and behaviour change interventions, as well as how data science techniques can be used to gain more insights and support into these behaviours and interventions. Data science for population health: you will use data science to investigate and promote healthy lifestyles at a population level. You can use various data sources, such as social media data, network data, community data, and policy data to answer research questions related to population health.

Food technology: in this track, large amounts of data, from detailed chemical, physical and microbiological measurements, but also data of consumer studies, epidemiological and socio-economical data are combined. You will learn to use data science to answer complex questions related to the field of food science and technology. Examples are more efficient, sustainable production processes, ensuring food quality and safety, and helping companies to better understand consumer preferences and wishes.

When designing a training program that covers both Food Analytics and Data Science, it's important to integrate concepts from both fields. Below is a suggested outline of subjects to cover in the training:

Module 1: Introduction to Food Analytics

1. Overview of Food Analytics
   - Definition and importance
   - Applications in the food industry
2. Types of Food Data
   - Nutritional data
   - Consumer behavior data
   - Supply chain data
   - Quality control data
3. Data Sources in Food Analytics
   - Public databases (e.g., USDA, FAO)
   - Industry reports
   - Social media and consumer reviews

Module 2: Fundamentals of Data Science

1. Introduction to Data Science
   - Definition and significance in various industries
   - Key components: statistics, programming, domain knowledge

2. Data Collection Methods
• Surveys and questionnaires
• Web scraping
• APIs and databases
3. Data Cleaning and Preparation
• Handling missing values
• Data normalization and transformation
• Feature engineering
Module 3: Statistical Analysis in Food Analytics
1. Descriptive Statistics
• Mean, median, mode
• Variance and standard deviation
2. Inferential Statistics
• Hypothesis testing
• Confidence intervals
• Regression analysis
3. Experimental Design
• A/B testing in food product development
• Sensory evaluation studies
Module 4: Data Visualization Techniques
1. Importance of Data Visualization
• Communicating insights effectively
2. Tools for Visualization
• Introduction to tools like Tableau, Power BI, and Python libraries (Matplotlib, Seaborn)
3. Creating Visualizations
• Bar charts, line graphs, heatmaps, and dashboards specific to food analytics
Module 5: Advanced Data Science Techniques
1. Machine Learning Basics
• Supervised vs. unsupervised learning
• Common algorithms (e.g., regression, classification, clustering)
2. Predictive Analytics in Food Industry
• Demand forecasting
• Price optimization
3. Natural Language Processing (NLP)
• Analyzing customer reviews and feedback
• Sentiment analysis
Module 6: Case Studies in Food Analytics
1. Real-World Applications
• Case studies on food safety and quality control

• Consumer trend analysis using social media data

2. Project Work

• Hands-on projects that involve analyzing real food-related datasets

Module 7: Ethical Considerations and Future Trends

1. Ethics in Data Science

• Data privacy and security issues in the food industry

• Ethical sourcing and transparency

2. Future Trends in Food Analytics

• The role of AI and big data in shaping the future of food production and consumption

• Sustainability practices through analytics

Conclusion and Certification

• Review of key concepts learned

• Final assessment or project presentation

• Certification of completion

Additional Resources

• Recommended readings and online resources for further learning

• Networking opportunities with industry professionals

This outline provides a comprehensive framework for training in Food Analytics and Data Science, ensuring participants gain both theoretical knowledge and practical skills applicable to the food industry.

REFERENCES:

1. Assuring food safety and quality: Guidelines for strengthening national food control systems. Joint FAO/WHO publication. 2005.–p.268.

2. Food analysis Laboratory manual. Second edition. Edited by S.Suzanne Nielsen Purdue University West Lafayette, IN, USA. Springer Science + Biseness Media, LLC 2010. – p. 129.

3. R. Normaxmatov va boshqalar. Tovarshunoslik. Toshkent: «Mehnat», 2004.4.

4. «Товароведение пищевых продуктов»: учебник для студ. учреждений сред. проф. Образования / З.П.Матюхина. – 7-е изд., испр. – М.: Издательский центр «Академия», 2016. – 336 с.

5. 5.В.А.Тимофеева Товароведения продовольственных товаров. Учебник. Изд-е 5-е, доп. и перер. – Ростов н/Д: Феникс, 2005. – 416 с. (СПО).

6. Bakhtiyorovich, Ismonov Khurshidbek, and Ruziyev Nuriddin Mukhammadaliyevich. "Pairing, Their Own Aspects and Corresponding Methods of Work with Pairing in the Autocad Software." *International Journal on Orange Technologies* 3.12 (2021): 211-216.

7. qizi Abduraimova, Muazzamoy Abduqodir. "PERSPEKTIVA." *INTERNATIONAL CONFERENCES*. Vol. 1. No. 11. 2022.

8. Xurshidbek, Ismonov, Rustamov Umurzoq, and Abduraimova Muazzamoy. "MARKAZIY VA PARALLEL PROYEKSIYA ORTOGONAL PROYEKSIYALAR VA MODELNI KO ‘RINISHLARI." *Educational Research in Universal Sciences* 1.4 (2022): 70-81.

9. Ismonov, Xurshidbek Baxtiyorivich, and Muazzamoy Abduqodir qizi Abduraimova. "ORTOGONAL PROYEKSIYALAR VA MODELNI KO ‘RINISHLARI." *Educational Research in Universal Sciences* 1.3 (2022): 288-296.

10. Qizi, Abduraimova Muazzamoy Abduqodir. "PROJECTION AND AXONOMETRY."