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FOREWORD

Health sciences have been among the fields where digital transformation has been experienced most rapidly and profoundly in recent years. At the core of this transformation, generative artificial intelligence technologies offer innovative solutions across a wide spectrum, ranging from clinical decision support systems and medical imaging applications to personalized treatment approaches and drug discovery. With advances in big data analytics, machine learning, and deep learning models, generative artificial intelligence contributes to making healthcare services more efficient, accessible, and sustainable.

The Congress aims to provide a comprehensive perspective on the current applications of generative artificial intelligence in health sciences, its interdisciplinary areas of use, and its impact on scientific research. Artificial intelligence-supported (AI-supported) models in diagnosis and prognosis processes, optimization of clinical workflows, secure and ethical use of patient data, health informatics infrastructures, and digital health solutions constitute the main focal points of the Congress. In addition, the contribution of generative artificial intelligence to healthcare professionals' decision-making processes and the future of human-machine collaboration are discussed in a multidimensional manner.

Within the scope of the Congress, not only current technological developments but also research areas expected to gain prominence in the future are addressed. Explainable artificial intelligence, reliable and transparent algorithms, ethical and legal frameworks, data privacy, AI-supported personalized medicine applications, and sustainable healthcare systems are among the key topics that will shape future health research. The integration of generative artificial intelligence into education, research, and clinical practice paves the way for the emergence of new paradigms in health sciences.

Through this Congress, it is aimed to promote the exchange of knowledge and experience among academics, healthcare professionals, researchers, and technology developers, thereby strengthening interdisciplinary collaborations. Jointly discussing the present and future of generative artificial intelligence technologies in health sciences is expected to make a significant contribution to the emergence of innovative research ideas and to the acceleration of scientific progress.

With our kind regards,

Prof. Arzu BALOĞLU

Congress Head

December 2025

CONGRESS PROGRAM

OPENING REMARKS		
10.00am– 10.30am	Prof. Güliden Z. OMURTAG DEAN, SCHOOL OF PHARMACY, ISTANBUL MEDIPOL UNIVERSITY	
	Prof. Arzu BALOĞLU CONGRESS HEAD HEAD, DIVISION OF PHARMACY MANAGEMENT, ISTANBUL MEDIPOL UNIVERSITY	
	Prof. Bahadır Kürşat GÜNTÜRK PRESIDENT, ISTANBUL MEDIPOL UNIVERSITY	
10.30am– 11.00am	Assoc. Prof. Samaneh (Sam) MADANIAN	Generative AI and Its Potential for the Digital Transformation of Mental Health Services
11.00am– 11.30am	Dr. Ahmet KAPLAN	Automated Transformation of Natural Language Queries Into OMOP-SQL via Agentic AI for Multimodal Clinical Data Integration: A Framework and Case Study Analysis
11.30am– 12.00pm	Soner HACIHALİLOĞLU & Prof. İker HACIHALİLOĞLU	Closing the Data Scarcity Gap in Ultrasound Imaging with PONS GenAI Synthetic Imaging Twins
12.00pm– 12.30pm	Retired Prof. Oğuz ÖZYARAL	Pharmacy 5.0: Transformation of the Profession in the Digital Age and a Vision for the Future
12.30pm– 1.00pm	Dr. Osama TABBARA	Leading with Vision: Inspiring Millennials in the Age of AI

1.00pm–2.00pm	LUNCH	
2.00pm–2.30pm	Dr. Christian WEBER, Dr. Hasan ABU-RASHEED, Dr. Kai HAHN & Prof. Madjid FATHI	Generating LLM-based Explanations for Learning Recommendations in Nursing Education Using a Knowledge Graph-based Framework
2.30pm–3.30pm	Prof. Mehmet GÖNEN	Computational Biology, Generative AI Models for Analyzing Single-cell Omics Data
3.30pm–4.00pm	Dr. Polat GÖKTAŞ	Human-centered Design in Generative Health AI: From Explainability to Epistemic Responsibility
4.00pm–4.30pm	Dr. Tanil ÖZKAN	A Hybrid LLM-TRIZ Approach for Developing Cost-efficient Public Health Solutions
COFFEE BREAK		
4.45pm–5.15pm	Dr. Yusuf T. ERTÜR	Where Were We, Where Are We Heading?
5.15pm–5.45pm	Prof. G. Bora ESMER	AI-enhanced Biomedical Imaging: Super-resolution, Robust Quality Metrics, and Quantitative Stiffness Mapping for Diagnostic Insight
	Dr. Sevgi SALMAN ÜNVER	Omic Technologies and Digital Twin Applications in the Personalized Healthspan and Lifespan
	Assist. Prof. Emel SOKULLU	Artificial Intelligence and Transformation in Healthcare Research
	Prof. Behçet Uğur TÖREYİN	AI in Health Care – Challenges
CLOSING CEREMONY		
5.45pm–6.00pm		

FROM THE OPENING REMARKS



FROM THE SESSIONS





ABSTRACTS

Generative AI and Its Potential for the Digital Transformation of Mental Health Services

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Abstract

Mental health disorders and their rising prevalence make exploring innovative artificial intelligence (AI)-driven methods for early detection increasingly important. Despite the existing clinical practices for diagnosing mental health disorders, the stigma associated with most of them discourages individuals from seeking medical or clinical advice. At the same time, there is a shortage of experts in the field, and clinical diagnosis has some limitations, including a degree of subjectivity. To address this, it is required to explore the recent advancements in AI and evaluate the role of large language models (LLMs) in mental health services. As a proof-of-concept, we first assessed state-of-the-art LLMs, including OpenAI's GPT-4.1, Google's Gemini 2.5, Anthropic's Claude 3.7, DeepSeek's DeepSeek V3, and Meta's LLaMA, in a zero-shot setting, where models are prompted to distinguish between depressed and non-depressed users based on their social media posts, without any task-specific training. Our findings reveal that LLMs demonstrate substantial zero-shot predictive capabilities for depression detection, significantly outpacing traditional machine learning benchmarks in terms of accuracy. These results underscore the promising potential of LLM-based systems for scalable and proactive mental health screening. However, there are critical considerations that must be addressed before AI models can effectively enhance clinical practices, including ethical safeguards regarding privacy, bias, and human oversight, to ensure the responsible implementation of LLM-enhanced depression detection systems.

Keywords: Gen AI, Mental Health, Digital Transformation, Large Language Models

Automated Transformation of Natural Language Queries Into OMOP-SQL via Agentic AI for Multimodal Clinical Data Integration: A Framework and Case Study Analysis

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Abstract

This study examines the critical challenge of integrating fragmented, multimodal clinical data—spanning structured electronic health records (EHR) elements and unstructured notes, imaging, and signals—to enable robust healthcare artificial intelligence (AI). It posits the OMOP common data model (CDM) as the foundational standard for data harmonization, essential for longitudinal patient modeling and generalizable research. The paper details a technical framework for incorporating unstructured data into OMOP via natural language processing (NLP) concept extraction and cross-modal temporal alignment. Its core contribution is the analysis of an emerging solution: using agentic AI and LLMs to automate the end-to-end transformation of raw, multimodal data into the OMOP CDM and, subsequently, to translate natural language queries into executable structured query language (SQL). This pipeline integrates document understanding, de-identification, and terminology normalization. A presented case study (Istanbul Medipol University Hospitals) underscores the prerequisite step of unifying siloed databases (e.g., 1,400+ tables) before implementing such Text-to-SQL systems. The study concludes that the convergence of OMOP standardization and agentic AI represents a scalable pathway toward holistic patient data models, directly enhancing clinician-facing tools for data retrieval and supporting downstream analytical applications.

Keywords: OMOP Common Data Model, Multimodal Data Integration, Natural Language to SQL (Text2SQL), Agentic AI, Electronic Health Records (EHR), Clinical Natural Language Processing (NLP), Healthcare Data Standardization

Closing the Data Scarcity Gap in Ultrasound Imaging with Pons GenAI Synthetic Imaging Twins

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Abstract

This study aims to address one of the most persistent challenges in medical imaging: the scarcity of high-quality, diverse datasets for training robust artificial intelligence (AI) models. Data scarcity limits the potential of Point-of-Care Ultrasound (POCUS) in disease detection, clinical decision-making, and medical research. PONS proposes a solution through GenAI, a diffusion model enhanced by innovative prompt engineering, capable of generating synthetic ultrasound “imaging twins” that are statistically indistinguishable from real scans. The research was conducted using a combined dataset of anonymized ultrasound images and radiology reports, which trained PONS’ generative models to produce clinically accurate synthetic data. Unlike conventional augmentation techniques, PONS GenAI generates realistic variations of disease presentations and anatomical conditions, while preserving diagnostic precision and eliminating privacy concerns. It focuses on bridging the gap between limited, real-world imaging data and the urgent need for large-scale, diverse datasets in AI model training, clinical education, and pharmaceutical research. By offering customizable, ethically generated synthetic datasets, PONS enables radiologists, researchers, and AI developers to access data previously unavailable to them. The main findings show that synthetic data created by PONS GenAI improves the performance of AI models, particularly in breast tumor detection and liver fibrosis staging. Medical education also benefits from realistic training simulations, while pharmaceutical companies can accelerate virtual clinical trials with synthetic imaging datasets. These results suggest that synthetic ultrasound imaging twins are not only a viable alternative to real data, but also a catalyst for scaling AI-driven healthcare solutions. Overall, the study contributes to overcoming data scarcity, advancing medical education, and accelerating innovation in health care through a safe, scalable, and ethically sound generative AI platform.

Keywords: Synthetic Imaging Data, Generative AI, Ultrasound Imaging, Radiology AI, AI in Health Care

Pharmacy 5.0: Transformation of the Profession in the Digital Age and a Vision for the Future

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Abstract

This study aims to conceptually define and analyze Pharmacy 5.0 as a human-centered transformation driven by emerging digital health technologies. It examines the impact of artificial intelligence, robotics, pharmacogenetics, Internet of Things (IoT), and telepharmacy on professional roles, competencies, and the clinical responsibilities of future pharmacists. The study further models the projected structure of the smart pharmacy 2030 ecosystem. A comprehensive literature synthesis was conducted using international reports (World Health Organization [WHO], Organisation for Economic Co-operation and Development [OECD], International Pharmaceutical Federation [FIP]), peer-reviewed articles, digital health technology assessments, and pharmaceutical industry analyses published between 2010 and 2024. A conceptual framework approach was adopted, enabling thematic evaluation of the 5.0 paradigm and its influence on the evolution of pharmacy practice. Additionally, the 2030 digital patient journey model was constructed using systems-thinking methodology. Four major transformations in the pharmacy profession were identified: (1) Strengthening of data-driven clinical roles: Artificial intelligence (AI)-supported decision systems and pharmacogenetic data enhance pharmacists' clinical interpretive capacity; (2) Expansion of digital service models: Telepharmacy, remote adherence monitoring, and mobile health applications redefine patient access and continuity of care; (3) Adoption of autonomous and sensor-based infrastructures: Robotic inventory management, real-time cold-chain monitoring, and personalized 3D-printed medications transform the pharmacy into an integrated digital health hub; and (4) Broadening of professional responsibilities: Future pharmacists will increasingly engage in data privacy, digital ethics, sustainable pharmacy practices, and community-based preventive health initiatives. Rather than posing a threat to the profession, technological advancements present an opportunity for redefinition and elevation. Pharmacists are positioned to become central clinical actors in risk management, personalized therapy optimization, and improved patient experience. However, this transition requires enhanced education, digital competency, and

interdisciplinary collaboration. Pharmacy 5.0 represents a digital transformation that strengthens—rather than diminishes—the professional identity of pharmacists. Technology does not replace the pharmacist; it amplifies their decision-making capability and clinical impact. This emerging paradigm repositions the pharmacist as a data-informed, patient-centered, clinical leader capable of managing complex therapeutic pathways in an increasingly digital healthcare environment.

Keywords: Pharmacy 5.0, Digital Health, AI, Pharmacogenetics, Telepharmacy, Smart Pharmacy, Clinical Decision Support Systems

Leading with Vision: Inspiring Millennials in the Age of AI

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Abstract

This presentation explores how today's tech-savvy, purpose-driven Millennials can become visionary leaders in a rapidly evolving, artificial intelligence (AI)-powered world. The talk begins by examining Millennials' core traits: digital fluency, a desire for meaningful work, and a strong inclination toward collaboration and innovation. It highlights their affinity for technology and AI, positioning them as drivers of change. However, to truly lead and inspire, Millennials must cultivate essential leadership qualities, such as emotional intelligence, adaptability, ethical responsibility, and a commitment to lifelong learning. By aligning their personal values with forward-thinking leadership and responsible AI use, Millennials can become influential role models who drive progress, empower teams, and shape a more inclusive and impactful future.

Keywords: Millennials, Visionary Leadership, AI, Digital Fluency, Purpose-driven Leadership

Generating LLM-based Explanations for Learning Recommendations in Nursing Education Using a Knowledge Graph-based Framework

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Abstract

The rising complexity of medical spaces requires continuous education across all job profiles. Especially in nursing education, where nursing professionals are interfacing between increasingly digital solutions and expanding further job roles, education has to be flexible towards individual needs, and fit to given vocational educational training (VET) requirements. In the context of personalized education, the use of comprehensive and accurate explanations for learning recommendations is essential to help foster learner engagement and understanding. While large language models (LLMs) have demonstrated remarkable capabilities in generating human-like textual explanations, their tendency to produce inaccuracies poses significant challenges, particularly in sensitive domains such as education. To address this limitation, we propose a novel approach that integrates structured, semantically enhanced knowledge graphs (KGs) together with LLMs for generating precise, contextually grounded explanations for learning recommendations. Within this work, we shed light on two application cases in nursing education (WBsmart project), representative for the non-formal and informal knowledge transfer in medicine, and academic formal education (IGNITE project), with individualized learning for higher education. Our method centers on the construction of a domain-specific knowledge graph, extracted and generated from educational materials. The materials in focus are from two medical project use cases (WBsmart, IGNITE). The KG is structured according to a four-level taxonomy, encompassing learning goals, courses, topics, and open

educational resources (OERs). Within this framework, learning objects (LOs), defined as courses, topics, and OERs, are represented as graph nodes, where each node is annotated with further metadata, such as titles, descriptions, and pedagogical attributes. Semantic relations between these LOs are created based on a customized text-mining pipeline that rates topic similarity between materials addressing the nodes; edges are created between nodes if the cosine similarity between contents exceeds a threshold. The graph structure enables the integration of semantically relevant context for explanation generation. To generate explanations, we deploy a hybrid pipeline that combines KG-derived context with a controlled LLM output. Domain experts are involved in the prompt engineering phase, where they define the roles the model should assume (for example, responding as a subject-specific tutor), clarify domain-specific terminology, and set pedagogical guidelines for the structure and content of explanations. The prompts are provided to GPT-4 and incorporate the primary task specification and supporting content extracted from semantically related LOs in the KG, as well as expert-defined roles and terminology. Explanations are generated using a template-based approach where the LLM fills predefined slots that are linked to learning objectives, prerequisite relationships, and a pedagogically sound justification for recommended resources. This method ensures that explanations are not only factually accurate, but also pedagogically coherent and tailored to the learner's context. The effectiveness of our approach is evaluated by both quantitative and qualitative measures. Quantitatively, we use ROUGE-N and ROUGE-L metrics to compare the generated explanations against expert-authored gold standards, observing substantial improvements in both precision and recall relative to explanations generated by GPT-4 without a KG context. In conclusion, this research demonstrates that grounding LLM outputs in structured knowledge graphs, combined with expert-driven prompt engineering and template-based generation, substantially enhances the precision and pedagogical value of artificial intelligence (AI)-generated explanations in an educational setting. Our framework establishes a paradigm for deploying generative AI in domains where factual accuracy is vitally important, such as the medical knowledge transfer and education. Future work will investigate dynamically updating the knowledge graph and further generalizing this approach across different educational domains.

Keywords: Medical Education, Knowledge Graphs (KGs), Explainable Learning Recommendations, AI-generated Explanations, Educational Knowledge Graph

Human-centered Design in Generative Health AI: From Explainability to Epistemic Responsibility

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Abstract

The rapid integration of generative artificial intelligence (AI) into healthcare systems has introduced great opportunities for enhancing clinical decision support, medical education, and patient engagement. Yet, it has also exposed deep epistemic and ethical challenges, ranging from algorithmic opacity and overreliance to the erosion of professional accountability. This presentation is about a human-centered design framework for developing and implementing generative AI systems in health care that move beyond mere transparency toward epistemic responsibility, ensuring that these systems align with how clinicians generate, justify, and apply knowledge in real-world practice. The talk begins by unpacking the limitations of conventional explainability approaches that emphasize technical interpretability while overlooking the cognitive and contextual needs of healthcare professionals. Drawing on insights from cognitive ergonomics, responsible AI governance, and clinical epistemology, the talk will outline a layered model of explainability, encompassing three interdependent dimensions: (1) Comprehensibility, ensuring that generative outputs align with clinicians' reasoning processes; (2) Justifiability, embedding ethical and evidential transparency into system recommendations; and (3) Actionability, designing feedback loops that allow users to question, calibrate, and refine AI-generated information. Building upon case studies from ophthalmology, dermatology, and nursing education, the presentation illustrates how co-design, with end-users, clinicians, educators, and patients, can bridge the gap between statistical accuracy and human trust. It further highlights the epistemic risks of "black-box" generation in diagnostic and educational tools, advocating for design interventions that balance automation with interpretive autonomy. Thus, this talk argues that the future of generative AI in health sciences depends not on more powerful models alone, but on reimagining how knowledge is generated, validated, and used within clinical ecosystems. By embedding human-centered design principles into the epistemic core of generative AI, we can foster systems that are not merely assistive, but genuinely collaborative, trustworthy, and ethically aligned with the practice of medicine.

Keywords: Generative AI in Health Care, Human-centered Explainability, Epistemic and Ethical AI, Trustworthy Clinical AI, Responsible AI Design

A Hybrid LLM-TRIZ Approach for Developing Cost-efficient Public Health Solutions

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Abstract

Generative artificial intelligence (AI) has revolutionized health science applications—from de novo drug and vaccine discovery to automated medical image synthesis, in silico clinical trial simulation, personalized treatment planning, electronic health records (EHR) summarization, digital therapeutic design, and virtual patient modeling. In pharmaceutical research, AI-based predictive models elucidate biological system behavior, drug interactions, and patient responses, empowering data-driven decision-making and risk mitigation. By tailoring interventions to genetic, lifestyle, and environmental factors, AI fosters personalized medicine paradigms that boost efficacy and reduce adverse effects. Visiting the other end of the healthcare spectrum, in this study, we introduce a hybrid methodology that harnesses TRIZ inventive principles alongside the unique strengths of LLM-powered, parameterized solution space refinement in curated knowledge bases to address two major public health challenges. This unique synergy enables rapid problem framing, systematic contradiction resolution, and scalable solution generation—all while mining vast scientific repositories. The TRIZ framework provides a structured path for innovation; the LLM component accelerates hypothesis generation, filters candidates by feasibility and cost, and continuously refines solution space through effective resource utilization (ERU) approach. Together, they form a highly effective engine for devising cost-effective, high-impact public health interventions. As a first application, we targeted vitamin D deficiency across the Gulf Cooperation Council region. Using our hybrid LLM-TRIZ pipeline, we formulated a biotechnology solution that leverages local agricultural by-products for low-cost micronutrient fortification. Economic modeling and public health impact analysis demonstrate both sustainability and affordability at scale, with AI-assisted justifications underscoring each design choice. In a second scenario, we applied the same LLM-TRIZ workflow to hospital wastewater treatment. By querying expansive biohazard, antibiotic resistance, and effluent treatment chemicals databases and employing TRIZ's contradiction matrix, we identified emerging alternatives, such as engineered enzymatic degraders,

novel adsorbent composites, genetically modified biocontrol agents, and emerging nanotechnology solutions. We then synthesized hybrid strategies that combine the highest-performing elements, yielding a suite of low-cost, scalable interventions for hospital wastewater treatment solutions. This paper details our methodological considerations, from iterative conditioning protocols to database integration and scalability drivers. Economic and public health impact assessments accompany each case study, illustrating how the hybrid LLM-TRIZ approach can be generalized to a wide array of global health challenges. Our results pave the way for future research that leverages AI and systematic innovation to deliver sustainable, cost-efficient solutions at population and urban scales.

Keywords: Generative AI in Health Sciences, LLM-TRIZ Hybrid Innovation, AI for Public Health Solutions, Sustainable and Scalable Healthcare Innovation, Knowledge-driven Health Interventions

Where Were We, Where Are We Heading?

Yusuf T. ERTÜR

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Abstract

There has been a remarkable transformation from manual workflows to fully automated systems, which is supported by the rise of domestically developed pharmaceutical technologies that are now being exported worldwide. This shift demonstrates Türkiye's growing capability to design, manufacture, and globalize high-quality health technologies. *The Power of Innovation*: Advances in automation, digitalization, and smart compounding have elevated patient safety, optimized clinical and technical workflows, and strengthened compliance with international quality standards. Innovation now serves as a cornerstone for more efficient, traceable, and standardized pharmacy operations. Artificial intelligence (AI) is poised to redefine the pharmacy landscape, enabling personalized therapies, intelligent medication management, predictive analytics, and enhanced decision-support systems. In this new era, pharmacists are becoming key drivers of digital transformation, shaping the future of health care with data-powered precision.

Keywords: AI-driven Pharmacy Innovation, Automated Compounding Services, Digital Transformation in Pharmacy, Smart and Personalized Pharmacy Care, Pharmaceutical Technology Exports

AI-enhanced Biomedical Imaging: Super-resolution, Robust Quality Metrics, and Quantitative Stiffness Mapping for Diagnostic Insight

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Abstract

Advances in artificial intelligence (AI)-enabled reconstruction and quantitative imaging are reshaping biomedical diagnostics by recovering clinically relevant details from acquisition-limited data and converting imaging observables into interpretable biomarkers. Image enhancement, metric design, and biophysical interpretation can be used for generalization of data-intensive settings, such as digital pathology and radiology workflows, where robustness and validation are prerequisites for translation. Four different studies are summarized below. The frequency-domain performance comparison index is useful for evaluating super-resolution (SR) outputs via harmonic/Fourier magnitude agreement, rather than relying exclusively on spatial-domain similarity measures that can be brittle under nuisance transformations. The presented metric in the study states that traditional metrics (e.g., structural similarity index measure [SSIM], peak signal-to-noise ratio [PSNR], mean-square error [MSE]) may misrank perceptual fidelity and demonstrates that the proposed harmonic-based index is comparatively resilient to intensity alterations and alignment distortions, while also documenting failure modes (e.g., missing-content corruption) and cross-image comparability caveats. A benchmark study presented herein evaluates deep SR models for off-axis digital holography—residual channel attention network (RCAN), image restoration using swin transformer (SwinIR), and a conditional diffusion network—against bicubic spline interpolation on 1,440 experimentally acquired holograms downsampled by $2\times$ – $4\times$. Critically, evaluation extends beyond intensity fidelity to phase-derived quantitative metrics and depth errors, reflecting the diagnostic importance of accurate quantitative phase imaging, rather than visually plausible textures alone. Across scales, RCAN and SwinIR provide the most accurate reconstructions, while the diffusion approach remains competitive as a generative alternative that preserves overall structure. The work further probes generalization on biological cell holograms

and emphasizes the requirement for more diverse training targets, such as adherent cells and tissue sections. Physics-informed constraints are used to reduce artifacts in real-world biomedical use. Advance label-free interpretation by reconstructing whole-sample stiffness maps—an emergent biomechanical biomarker linked to cancer progression. An acousto-holographic system combines acoustic stimulation with interferometric holography to rapidly reconstruct whole-cell stiffness distributions, enabling differentiation of epithelial HCT116 cells from TGF- β -treated, CTC-mimicking counterparts and reducing acquisition/processing time to seconds, relative to AFM-scale mapping. A complementary, off-axis, Mach-Zehnder, bulk-acoustic-wave holographic sensor refines measurement uniformity via structured imaging and calibration, demonstrating repeatable stiffness estimates on cell-mimicking polyacrylamide beads and outlining a pathway toward scalable mechanobiology and cancer diagnostics.

Keywords: AI-based Quantitative Imaging, Super-resolution in Biomedical Imaging, Holographic Reconstruction and Metrics, Physics-informed Imaging AI, Label-free Cancer Biomarkers

Omic Technologies and Digital Twin Applications in the Personalized Healthspan and Lifespan

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Guest Lecturer, Boğaziçi University, Türkiye

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Abstract

This presentation explored the transformative role of omic technologies—including genomics, epigenomics, transcriptomics, proteomics, metabolomics, and microbiomics—together with digital twin health models, in advancing a personalized approach to healthspan and lifespan optimization. The speech emphasized that aging and chronic disease emerge from a dynamic, systems-level interaction between genetic background, epigenetic regulation, environmental exposures, lifestyle factors, and biological networks, rather than from genetic determinism alone. Omic sciences provide deep molecular insights into these interactions, while digital twin frameworks integrate multi-omic, clinical, behavioral, and environmental data to create dynamic, individualized virtual representations of an individual's health state. Key applications discussed included: (1) Genomics and epigenomics for individualized risk stratification, gene-environment interactions, and identification of modifiable epigenetic targets; (2) Transcriptomics and proteomics for real-time assessment of cellular function, inflammation, immune regulation, and aging-related signaling pathways; (3) Metabolomics and microbiomics as sensitive indicators of metabolic flexibility, gut–host communication, and lifestyle responsiveness; and (4) Digital twin applications for continuous health monitoring, simulation of lifestyle or therapeutic interventions, prediction of biological aging trajectories, and proactive risk mitigation across the lifespan. Integrating multi-omic data into digital twin models shifts the focus from population-based recommendations to continuously adaptive, personalized health strategies. This approach supports the early detection of disease susceptibility, the optimization of resilience, and the preservation of functional capacity. Challenges related to data interoperability, clinical validation, ethics, and equitable access were also addressed. The presentation concluded that the future of longevity lies in extending years lived in good health, supported by omic technologies and digital twin-driven decision frameworks that guide individualized healthspan journeys.

Keywords: Omics and Digital Twin Health, Personalized Longevity Strategies, Multi-omic Precision Health, Digital Twin-driven Health Care, Systems Biology of Agi

SLIDES

CLOSING THE DATA SCARCITY GAP IN ULTRASOUND IMAGING WITH PONS GENAI SYNTHETIC IMAGING TWINS

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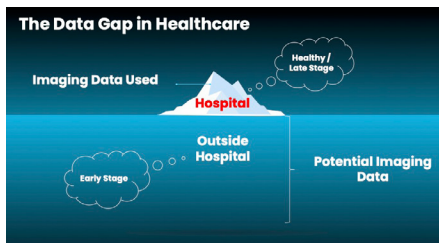
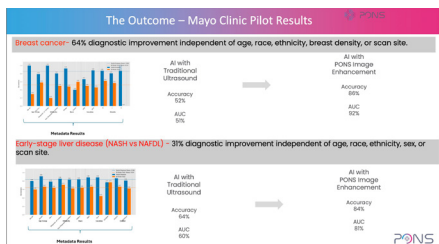
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Bridging Data Gaps in Healthcare

What if your **everyday ultrasound** could become the imaging **data source** on **early-stage disease**?

Soner Hacihaliloglu - "1st International Congress on Generative AI in Health Sciences" Conference
10. December.2025 - Istanbul

PHARMACY 5.0: TRANSFORMATION OF THE PROFESSION IN THE DIGITAL AGE AND A VISION FOR THE FUTURE

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Historical Flow of Digital Pharmacy



1.0 Craftsmanship era – 2.0 Industrial production – 3.0 Computer age – 4.0 Digitalization – 5.0 Smart, personalized pharmacy


Pharmacy has undergone a journey from the hand-crafted practices of 1.0 to the industrial production of 2.0, the computerization of 3.0 and the digitalization of 4.0.

With 5.0, all these stages converge into a new era of smart, data-driven and personalized pharmacy.

The evolution of pharmacy from 1.0 to 5.0.

6

Personalized Therapy (Pharmacogenetics)



– Drug selection based on genetic profile
– Individualized dosing
– Prediction of adverse effects

As the patient's genetic profile becomes a key determinant in drug selection, therapies gain a truly individualized structure.


Pharmacogenetics explains why patients respond differently to the same drug and thereby makes the pharmacist's role in therapy management even more strategic.

10

– Making sense of data
– Turning data into clinical decisions
– Digital competence

The pharmacist's new role is to interpret large datasets and translate them into clinical decisions. Data literacy makes the pharmacist more predictive, more effective and more powerful in therapy management.

Data Literacy



Data-literate pharmacists make stronger clinical decisions.

17

Mobile Health Integration



– Smartwatch data
– Digital medication adherence
– Home-based health monitoring

Thanks to smartwatches, mobile applications and home monitoring devices, the patient's health data can reach the pharmacist in real time.

The pharmacist thus becomes a consultant who can monitor not only the patient's medication but also their overall health behaviour.

23

LEADING WITH VISION: INSPIRING MILLENNIALS IN THE AGE OF AI

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Leadership with Vision: Inspiring Millennials in the Age of AI

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President, IVPN-Network

GEN Y

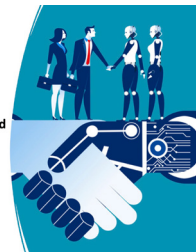
GEN Z

Who They Are

- Purpose-driven generation, Impact-Oriented
- Value flexibility, transparency, and authenticity
- Digital natives with high expectations for innovation
- Prefer collaborative and inclusive environments

Creating a Future-Ready Culture

- Foster innovation and adaptability
- Develop hybrid digital + soft skills



Multiplier Leaders are Genius Watchers

Everyone is brilliant in something!

Never shut down good ideas and smart people

Capable to scan and name the native genius, so they help them to thrive

My last
advice to the
Gen Z and Y

- Be visible
- Be non-traditional
- Be innovative
- Be a disruptor
- Be crazy as you are!

COMPUTATIONAL BIOLOGY, GENERATIVE AI MODELS FOR ANALYZING SINGLE-CELL OMICS DATA

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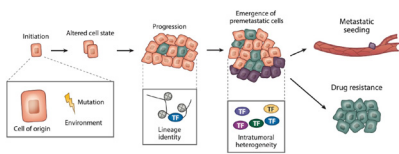
Generative AI models for analyzing single-cell omics data sets

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December 10, 2025

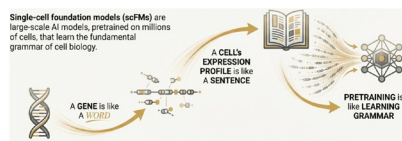
Understanding single-cell biology



(LaFave et al., 2022)

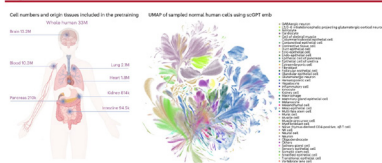
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Single-cell foundation models



4/22

scGPT results



(Cui et al., 2024)

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Conclusions

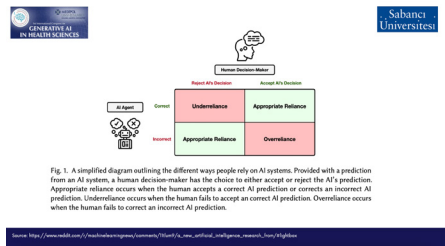
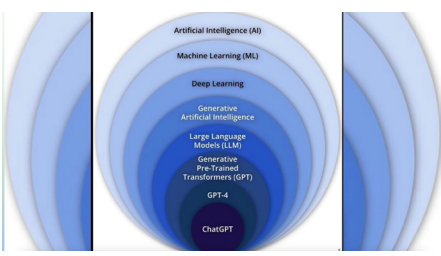
- Deep learning models may not be trained reliably on small-data scenarios
- Not all foundation models are the same
- Foundation models should be fine-tuned for your problem
- Foundation models that combine multiple omics data will dominate

22/22

HUMAN-CENTERED DESIGN IN GENERATIVE HEALTH AI: FROM EXPLAINABILITY TO EPISTEMIC RESPONSIBILITY

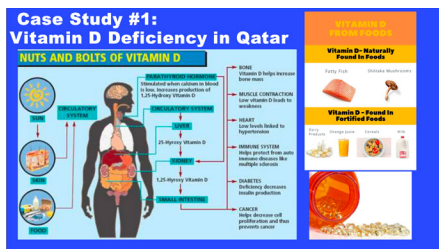
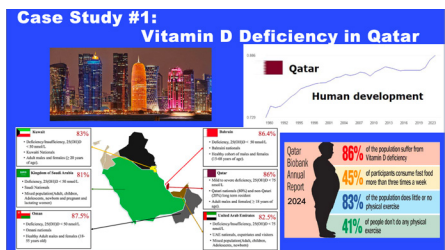
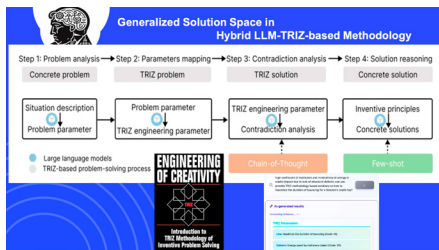
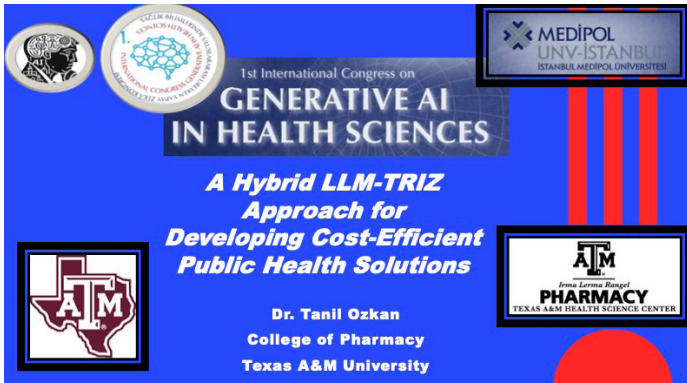
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A HYBRID LLM-TRIZ APPROACH FOR DEVELOPING COST-EFFICIENT PUBLIC HEALTH SOLUTIONS

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 College of Pharmacy, Texas, United States
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Conclusions:

- Feasibility: Hybrid LLM+TRIZ produced actionable, cost-efficient public-health solutions.
- Rapid extraction: TRIZ mapping + LLM yielded prioritized, literature-aligned options (e.g., UV-treated mushrooms; p-CN magnetic photocatalysts).
- Pilot readiness: Several solutions are pilot-ready (e.g., Alberta Health Services wastewater trial).
- Cost & scale: Identified low-cost, scalable routes and recoverable materials to ease deployment.
- Next steps: Require targeted validation, stakeholder engagement, and monitoring.

WHERE WERE WE, WHERE ARE WE HEADING?

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Dr., Director, Kapsam, Türkiye

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WHERE WERE WE, WHERE ARE WE HEADING?

Innovation in Pharmacy Compounding Services powered by
Automation, Export Growth, and an AI-Driven Future in Pharmacy

Yusuf T. Ertür, BSc (E&E Eng), MBA
Sales and Marketing Director, Kapsam

Where Were We – Where Are We Heading?

- The evolution of pharmacy compounding over the last 30 years
 >>> From manual preparation to digital and automated systems
- Shifting role of pharmacists in the healthcare ecosystem
 >>> Patient and technology-oriented approach

Online Audience – Visitors (2024 Analytics)

Google Analytics: 15K Active users, 29K New users, 2m 58s average engagement time per active user

Medical Park: 264,363 Visitors, 5,443 Leads, 1,552 New Leads, 365 New Patients

LinkedIn: 38,828 Followers, 921 New Followers, 4,167 Visitor highlights, 1,805 Follower highlights

Automated Compounding Systems (TPN – ONCO – IV)

Key Features & Benefits

Seamless Workflow

- Scalable up and downline compounding processes
- Easy setup and operation
- 24/7 remote support and free upgrades

Safety & Accuracy

- Eliminates transcription, manual addition and infection risks
- Prevents human errors with automated operations
- Ensures advanced gravimetric control and accuracy

Kapsam Advanced Solutions for Compounding Pharmacies

Key Takeaways

- Pharmacy compounding is moving from manual to fully automated systems.
- Automation is essential for safety, accuracy, and efficiency.
- Türkiye is now a global developer and exporter of pharmacy technologies.
- KAPSAM offers proven automation solutions for sterile preparation area.
- AI is the next major driver of safety and decision support in pharmacy.
- The future of pharmacy is automated, AI-powered, and globally connected.

AI-ENHANCED BIOMEDICAL IMAGING: SUPER-RESOLUTION, ROBUST QUALITY METRICS, AND QUANTITATIVE STIFFNESS MAPPING FOR DIAGNOSTIC INSIGHT

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Healthcare Transformation through AI

Paradigm Shift in Medical Imaging

- From manual interpretation: Radiologists spending hours analyzing images manually
- To AI-assisted workflows: Intelligent systems providing real-time analysis and decision support
- Clinical impact: 69% reduction in false positives; 17% reduction in reading time
- Scale of adoption: AI increasingly integrated across radiology, pathology, and diagnostics
- Multi-modal integration: MRI, CT, PET, X-ray, ultrasound, and digital pathology

Three Pillars of AI Medical Imaging

Image Generation
 GANs and diffusion models synthesize realistic medical images; address data imbalance, enable low-dose acquisition

Image Enhancement
 Deep learning noise reduction, artifact removal, super-resolution; 30%+ SNR/CNR improvement

Image Interpretation
 CNN/transformer-based detection, segmentation, classification; 95-98% sensitivity in pathology

Image Generation: Creating Synthetic Medical Data

Generative AI Architectures

- GANs (Generative Adversarial Networks): Chest X-rays with diverse pathologies; synthetic disease manifestations
- Diffusion Models: High-fidelity iterative denoising; superior quality over GANs in recent studies
- Modal Translation (Pix2Pix): CT—MRI, T1—T2, modality conversion with physical accuracy
- Temporal Synthesis: PET imaging at different time points; dynamic 4D reconstruction
- Clinical benefit: Balances imbalanced datasets; enables low-dose, cost-effective acquisition

JBO Journal of Biomedical Optics

RESEARCH PAPER

Noninvasive holographic sensor system for measuring stiffness of soft micro samples

Hasan Berkay Arsovolu^{1,2}, Gökhan Bora Esmer¹, and Mustafa Kemal Yılmaz^{1,2}

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 Accepted for publication 15 May 2023
 Published online 22 May 2023

ORIGINAL PAPER

Performance comparison index for image super-resolution

Sakine Kocaman¹, Gökhan Bora Esmer¹

Received 10 May 2024; Revised 16 June 2024; Accepted 1 July 2024; Published online 1 August 2024
 The following article is published in *Journal of Biomedical Optics*, Vol. 29, No. 8, August 2024

nature communications

Acousto-holographic reconstruction of whole-cell stiffness maps

Received 27 April 2023
 Accepted for publication 15 May 2023
 Published online 22 May 2023

Benchmark study of deep super-resolution models for digital histology: quantitative phase and intensity evaluation

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ARTIFICIAL INTELLIGENCE AND TRANSFORMATION IN HEALTHCARE RESEARCH

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Artificial Intelligence and Transformation in Healthcare Research

*From early diagnosis to personalized treatments
Artificial Intelligence is revolutionizing healthcare.*

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ETILER SOROPTIMIST CLUB, TURKISH FEDERATION OF SOROPTIMIST CLUBS



Türkiye Soroptimist Kulüpleri Federasyonu

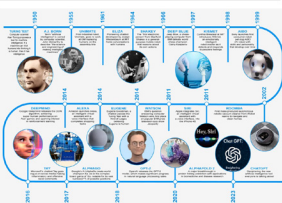


Etiler Soroptimist Kulübü



History

- First applications with expert systems in the 1960s and 1970s
- Increase in genomic data
- Widespread adoption of electronic health records (EHR)
- Advances in computing power



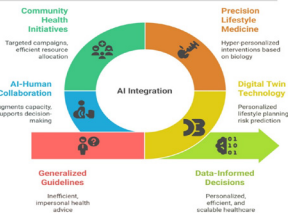
Telemedicine and Remote Health Monitoring

- Real-time data collection from wearable devices
- Patient support with chatbots and digital assistants
- Early intervention in emergencies with remote monitoring



Future Perspective

- More accurate epidemiology
- Digital patient counseling
- Smart record management
- Ethics and data security



Drug Development & Big Pharma Applications

AI accelerates drug discovery and reduces costs by 30%

Risk prediction in polypharmacy

40% reduction in medication dosing errors with AI

Examples: IBM Watson for Drug Safety

Exscientia, Insilico, BenevolentAI, Tempus.



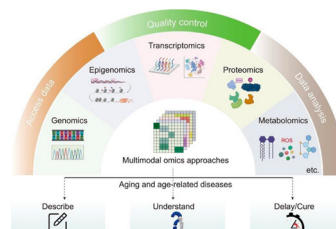
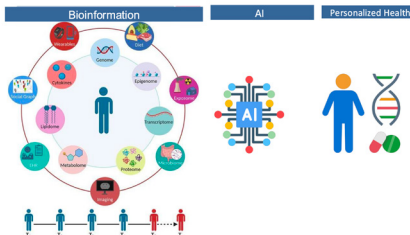
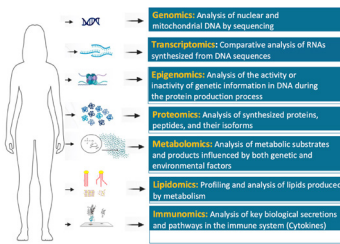
OMIC TECHNOLOGIES AND DIGITAL TWIN APPLICATIONS IN THE PERSONALIZED HEALTHSPAN AND LIFESPAN

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AI IN HEALTH CARE – CHALLENGES

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AI in Healthcare - Challenges

Research Directions @ SP4CING

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PI @ Signal Processing for Computational Intelligence Research Group – SP4CING

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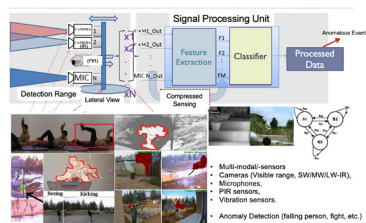
Dept. of AI and Data Engineering, Istanbul Technical University

Medipol University
 Dec. 10th, 2025

Signal Processing for Computational Intelligence (SP4CING) – spacing.itu.edu.tr

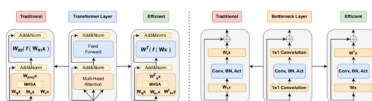
- ▶ Feb. 2018 | 20+ Members (PhDs/ Grad. Students)
- ▶ **Research Focus:**
 - ▶ Design signal processing tools/techniques for computational intelligence applications
- ▶ **Applications:**
 - ▶ Multi-modal Surveillance [Compressed Domain Analysis, Video/Audio/PIR sensor analysis]
 - ▶ Bio-image analysis [Digital Pathology, Myelin Quantification, Karyotyping/super-resolution]
 - ▶ Environmental Monitoring [Wildfire Detection, Fish Tracking, Soil Moisture Monitoring, Wind Speed/Turbulence Estimation]
 - ▶ Remote Sensing [Hyperspectral Data Compression, Anomaly Detection]
 - ▶ UAVs [Image Analysis Based Autonomous Landing]
 - ▶ Superconductor Sensor Analysis [Seismic/Magnetic Signal Analysis]

Multi-modal Surveillance Systems



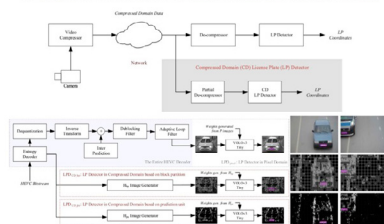
Model Compression / Parameter Re-use for Green AI

▶ Re-use weights in CNN and Transformer Architectures.



- ▶ Half of the weights are enough
- ▶ Green AI approaches will be applied to Digital Twins

Compressed Domain Video Understanding



WORKSHOPS

Aromatherapy Workshop

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Aromatherapy is a branch of modern phytotherapy that aims to benefit from the effects of various active compound groups present in essential oils. It is particularly applied in the management of common cold symptoms, stress coping, sleep regulation, dermatological and rheumatological disorders, and in supporting the immune system.

Modern aromatherapy is supported by scientific research, in addition to traditional medical knowledge, and is commonly used in areas such as stress management, insomnia, pain relief, and immune system support (Price & Price, 2007; Zeybek, 2023; Kurt & Çankaya, 2021). It represents an evidence-based medical approach, in which controlled essential oils obtained from specific plant sources are used internally and externally to support or improve individual health.

The term “aromatherapy” was first used in a book published in 1936 by the French chemist René-Maurice Gattefossé, who is therefore regarded as the father of modern aromatherapy. Gattefossé reported that after burning his hand in the laboratory, he immersed it in a container containing lavender oil, observing rapid healing of the burn. Following this incident, his interest in essential oils increased, and during World War I, while working in a military hospital, he reportedly treated gangrene, wounds, and burns more rapidly with essential oils than conventional methods. Gattefossé classified essential oil components according to their functional groups, and French aromatherapy developed based on this concept. The French physician Jean Valnet also began using essential oils during World War II, in 1945, and achieved remarkable therapeutic outcomes.

Marguerite Maury also played a significant role in the recognition of aromatherapy. From the 1960s onward, she incorporated essential oils into massage techniques in France and reported her notable results in her publications (Kurt & Çankaya, 2021).

English aromatherapist Robert Tisserand introduced this practice to English-speaking audiences, and played an important role in its development. Through the contributions of these pioneers, aromatherapy has reached a prominent position today. However, it is well known that humans used fragrant substances therapeutically long before these figures, and the field has continued to progress rapidly with many other researchers and practitioners since then (Kurt & Çankaya, 2021).

Mechanism of Action of Aromatherapy

Aromatherapy is a highly effective complementary therapeutic method when applied correctly and at the appropriate time. It has strong effects in promoting mental calmness, relaxing the body, relieving pain, and regulating body systems, depending on the components of essential oils. The use of essential oils in the body alters body chemistry, supports physiological systems, and simultaneously improves mental and emotional states.

Perception of Odor

Humans have the ability to distinguish more than ten thousand different odors (Zeybek, 2023; Kurt & Çankaya, 2021). Odor molecules are transmitted via the olfactory epithelium to the olfactory bulb (cranial nerve I), where they are converted into nerve impulses and conveyed to the olfactory center. Subsequently, the limbic system becomes involved (Price and Price, 2007; Zeybek, 2023).

Essential Oils

Essential oils are terpene-structured, natural substances accumulated in specialized cells of medicinally accepted plants, such as leaves, flowers, roots, or rhizomes. In pharmacy, they are regarded as drug raw materials and are referred to as “drogues” (Zeybek, 2023).

In plants, essential oils are mainly stored as tiny droplets within glandular hairs or secretory cavities. Examples of some crude drugs containing essential oils and their botanical sources include:

- **Flowers:** Rose (*Rosa damascena*), Jasmine (*Jasminum* spp.), Lavender (*Lavandula* spp.)
- **Peel:** Citrus fruits – Orange, Lemon (*Citrus* spp.)
- **Leaves:** Bay Laurel (*Laurus nobilis*), Geranium (*Pelargonium graveolens*), Sage (*Salvia* spp.)
- **Rhizome:** Ginger (*Zingiber officinale*)
- **Resin:** Pine (*Pinus* spp.), Sweetgum (*Liquidambar* spp.), Frankincense (*Boswellia serrata*)
- **Wood:** Cedar (*Cedrus atlantica*)

Fixed Oils (Carrier Oils)

Carrier oils (also known as fixed oils) are lipophilic molecules, similar to essential oils. The saturated or unsaturated nature of fatty acids, their percentage composition, and extraction method determine the characteristics and value of the oil.

Omega fatty acids, such as Omega-3 and Omega-6, are essential fatty acids that cannot be synthesized by the human body, whereas Omega-9 can be produced endogenously. The extraction technique is also crucial. Cold-pressed oils contain fat-soluble vitamins A, D, E, and K, and, due to their molecular size, they penetrate the deeper layers of the skin rapidly when applied topically, promoting cellular regeneration and preventing free radical damage (Zeybek, 2023).

Although cold-pressed oils yield lower quantities, the absence of heat treatment preserves fat-soluble vitamins and other bioactive components. Carrier oils used in aromatherapy predominantly consist of unsaturated fatty acids with double bonds, and often occur as polyunsaturated fatty acids. Increased unsaturation lowers the temperature at which the oil remains liquid.

Skin penetration varies depending on molecular size, skin temperature, and hydration. For massage applications, approximately 10–15 mL is sufficient for adult women of average body weight, and 15–20 mL for men. Essential oils are added at specific concentrations to achieve the desired therapeutic effect (Zeybek, 2023).

Aromatherapy Applications

- **Inhalation (Steam/Diffuser):** the inhalation of vapors, gases, or fine droplets through the respiratory tract.
- **Massage:** the application of essential oils combined with manual techniques to promote relaxation, reduce stress, improve sensory recovery, and support sleep.
- **Compress:** the application of a clean, moist cloth to the affected area.
- **Baths:** the use of therapeutic baths to support sleep, reduce stress, and relieve rheumatic, respiratory, and infectious skin conditions.
- **Topical Applications:** the direct application of essential oil and carrier oil mixtures to the affected area.
- **Gargles and Mouth Rinses:** the use of diluted essential oil solutions for oral hygiene and throat care.

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Sensory and Chemical Layers of Perfume Notes: An Applied Workshop Experience

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The sense of smell is one of the earliest and strongest perceptual connections humans establish with their environment. This sensory system becomes active before the development of visual and auditory perception, and is directly associated with memory, security, and recognition mechanisms, particularly in early childhood. In the literature, the strong connection between olfactory perception and the limbic system explains why scents are so closely intertwined with emotions and memories. In this context, smell can be considered not merely a learned stimulus, but a form of perception that is directly experienced and encoded in memory.

Within the discipline of perfumery, the concept of a “bad smell” does not represent an absolute judgment, but rather a relative evaluation dependent on context, dosage, and compositional balance. A note that may be perceived as intense, sharp, or unconventional on its own can acquire an entirely different character when combined with appropriate components. Based on this perspective, the primary aim of the workshop was to enable participants to recognize, perceive, and evaluate scents independently of normative judgments and within a multilayered structure.

Within the scope of this study, an applied perfume workshop was conducted with approximately 20 participants. Throughout the event, the structural organization of perfumes was examined through the concepts of top, middle, and base notes; additionally, the role of synthetic aroma molecules commonly used in modern perfumery was discussed, both theoretically and experientially.

The Layered Structure of Perfume Notes

Perfumes are dynamic structures that evolve and change over time. The notes perceived at the initial moment of contact do not represent the full character of the fragrance; rather, this structure emerges through the gradual unfolding of different layers over time.

Top notes are the first and most volatile components perceived upon application of a perfume. They are generally fresh, lively, and energetic in character. Within the workshop, citrus and fruity notes, such as mandarin, lemon, orange blossom profile,

and pineapple were examined, and their role in forming the initial impression was observed through practical applications.

Middle notes constitute the heart of the perfume and become dominant after the evaporation of the top notes. The character, emotional tone, and identity of a fragrance largely become apparent at this stage. Through floral notes such as jasmine, ylang ylang, Bulgarian rose, white rose, tulip, and cherry blossom, the effects of floral profiles on perceptions of intensity, softness, and romantic expression were discussed.

Base notes form the most persistent and profound layer of a perfume. These notes interact with the skin over extended periods and are responsible for the lasting impression left in memory. Through notes such as cedar, sandalwood, patchouli, vetiver, vanilla, white amber, and powdery accords, the contribution of woody, earthy, and warm characteristics to the overall composition was evaluated.

The Role of Synthetic Aroma Molecules

In addition to natural essences, synthetic aroma molecules play a significant role in modern perfumery. These molecules are not used solely to enhance longevity, but also to optimize diffusion, transparency, and interaction with the skin. Within the workshop, Iso E Super and Hedione were specifically examined; the skin-blending, woody character of Iso E Super and the invigorating effect of Hedione on floral notes were explored through applied examples.

Conclusion

This applied workshop aimed to encourage participants to evaluate perfume not only as an aesthetic product, but as a multilayered system encompassing sensory, psychological, and chemical dimensions. The observations obtained indicate that olfactory perception is shaped by individual experience, and that each note combination conveys a distinct narrative. In this context, perfume can be regarded as a silent story written on the skin over time, extending beyond its individual olfactory components.

Lingify Entrepreneurship – From Idea to Impact Workshop

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This workshop was designed to enable individuals to recognize their differences, reconsider their roles and responsibilities within a team in line with these differences, and experience production processes focused on social impact. The core approach of the workshop is based on the idea that personal competencies are shaped according to the areas in which individuals position themselves, and that these differences transform into a mutually reinforcing structure within teamwork. Throughout the workshop, it was emphasized that taking an active role in social and civil communities provides an important learning space for individuals' professional and personal development. Together with the participants, discussions focused on how volunteerism, social responsibility, and social benefit-oriented activities contribute to individuals recognizing their strengths and developing new competencies.

Within this framework, the origin point and social contribution focus of the Lingify initiative were addressed as a key component of the workshop. Lingify is a venture that develops artificial intelligence-based digital solutions in health care, specifically aiming to support the assessment, therapy, and daily communication needs of individuals with aphasia.

Aphasia is a neurogenic communication disorder that affects not only an individual's language and communication skills, but also their social participation, independence, and quality of life. Developed in response to this need, Lingify aims to combine technology with a human-centered approach, addressing clinical, social, and societal benefit together. Built in line with this vision, Brodmann 44 takes its name from the brain region associated with language production and is positioned as a community and impact space shaped around communication, neurological awareness, and social impact. Brodmann 44 is defined as a structure that aims to raise awareness in the field of communication disorders—particularly aphasia—strengthen multidisciplinary collaborations, and produce sustainable social impact for disadvantaged groups. During the workshop, this vision of Brodmann 44 was discussed through the importance of building structure and community in social impact creation.

In the following part of the workshop, the Design Thinking approach was introduced to participants. This section summarized the human-centered, problem-solving process, consisting of empathy, defining the problem correctly, ideation, prototyping,

and testing. Especially in solutions developed in the fields of health care and social impact, it was emphasized that understanding the user and the context is as critical as technical competence. The determining role of empathy-based approaches in developing solutions that respond to real needs and are applicable in practice was discussed through examples.

In addition to this theoretical framework, the EntreComp – European Entrepreneurship Competence Framework was briefly introduced. It was stated that EntreComp serves as a reference framework, defining which competence areas individuals should develop throughout the journey from idea to value, and the relationship between the workshop activities and these competencies was explained. Following the theoretical input, a hands-on activity was conducted based on experiential learning strategies. Participants were encouraged to develop ideas with high social impact potential, particularly targeting disadvantaged groups. Among the generated ideas, those selected by collective team decision were evaluated based on problem definition, objectives, impact potential, and feasibility criteria. During the evaluation process, ideas were analyzed using a persona-based approach, and the effects of identified problems on different user profiles were discussed. This stage highlighted participants' ability to develop diverse perspectives on the same problem and demonstrated how dynamic, team-based decision-making processes can be.

During the workshop's conclusion, emphasis was placed on the ever-evolving nature of teams and the cognitive diversity of individuals. It was noted that reaching a common ground—even regarding the same product or idea—is not always easy. However, when managed effectively, these differences can contribute to developing stronger and more inclusive solutions. Overall, the workshop provided a multi-layered learning environment in which participants increased their individual awareness and developed human-centered thinking skills by experiencing approaches focused on social impact and artificial intelligence in health care. In line with the vision of Lingify and Brodmann 44, the workshop showcased a holistic approach that integrates technology, social benefit, and social responsibility.

FROM THE CLOSING CEREMONY



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