Medical Informatics
with Artificial Intelligence

Joint Research and Teaching

General Objective
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Our overarching goal for the inaugural Mexico-Germany Hybrid Summer School in Medical Informatics is to ignite a powerful and enduring collaboration between TU Braunschweig and UNAM. We aim to create a vibrant interdisciplinary learning environment that not only introduces participants to cutting-edge advancements in medical informatics but also fosters a strong network of future professionals and researchers across borders. This first chapter is about laying the foundation for a sustained exchange of knowledge, ideas, and cultural understanding in this vital field.

Specific Objectives
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- Describe AI applications in areas such as imaging, signals, LLMs, robotics, or Internet of Medical Things (IoMT), and emphasizing the critical role of software systems and interoperability in their integration.
- Discuss the key ethical considerations surrounding the implementation of AI in healthcare, referencing specific examples.
- Promote transdisciplinary, simulation-based, and personalized learning experiences to democratize AI literacy in medicine, leveraging decentralized, open-access, and ethically grounded pedagogical strategies.
- Collaborate effectively in interdisciplinary teams to address challenges in medical informatics.
- Recognize the importance of gender equity and sustainability in the field of medical informatics.
- Articulate potential avenues for future research and collaboration within the Mexico-Germany context.

Program of Activities
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Day One: August 25, 2025 Location: Auditorium, IIMAS – UNAM			
México Time	**Activity**	**Speaker(s)**	**Germany Time**
8:00-8:30	Participant Registration		16:00-16:30
8:30-9:30	Opening Ceremony & Institutional Welcome	Dr. Ramses Mena (Podium)	16:30-17:30
9:45-10:45	Lecture 1: General Introduction to ML/AI	Prof. Dr. Thomas Deserno (Germany)	17:45-18:45
11:00-12:00	Lecture 2: Interpretability and Robustness of ML/AI	Prof. Dr. Tim Kacprowski (Germany)	19:00-20:00
12:15-13:00	Lecture 3: Doctors vs. Algorithms: How Medicine and AI Understand Disease Differently	Prof. Fis. Jessica Huelgas Moreno (Mexico)	20:15-21:00
	Free Time		
13:00	Launch Online: Self-managed Learning Activity 1	HealthyAI & MissionBrain Volunteers	21:00

Program of Activities

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Day Two: August 26, 2025 Location: Auditorium, IIMAS – UNAM			
México Time	**Activity**	**Speaker(s)**	**Germany Time**
8:00-8:30	Participant Registration		16:00-16:30
8:30-9:30	Lecture 4: ML/AI for Medical Image Analysis	Dr. Thomas Deserno (Germany)	16:30-17:30
9:45-10:45	Lecture 5: Anomaly Detection in Biomedicine, from Statistics to Deep Learning	Dr. J. Antonio Neme Castillo (Mexico)	17:45-18:45
11:00-12:00	Lecture 6: From Mycin to My Sin: The First Software for Prescribing Antibiotics	Ron S. Leder (USA)	19:00-20:00
12:15-13:00	Guided Preparation for Self-managed Learning Activities	HealthyAI & BrainMission Volunteers	20:15-21:00
	Free Time		
13:00	Launch Online: Self-managed Learning Activity 2	HealthyAI & MissionBrain Volunteers	21:00

Program of Activities

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Day Three: August 27, 2025 Location: Auditorium, IIMAS – UNAM			
México Time	**Activity**	**Speaker(s)**	**Germany Time**
8:00-8:30	Participant Registration		16:00-16:30
8:30-9:30	Lecture 7: ML/AI in Digital Pathology	Prof. Dr. med. Friedrich Feuerhake (Germany)	16:30-17:30
9:45-10:45	Lecture 8: Bridging AI and Radiomics: Better Glioma Prognosis and Patient Care	Dra. Myriam M. Altamirano-Bustamante (Mexico)	17:45-18:45
11:00-12:00	Lecture 9: Mini-Workshop: Automated Information Extraction from Electronic Medical Records	Dra. Helna Gómez (Mexico)	19:00-20:00
12:15-13:00	Guided Preparation for Self-managed Learning Activities	HealthyAI & BrainMission Volunteers	20:15-21:00
	Free Time		
13:00	Launch Online: Self-managed Learning Activity 3	HealthyAI & MissionBrain Volunteers	21:00

Program of Activities

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Day Four: August 28, 2025 Location: Auditorium, IIMAS – UNAM			
México Time	**Activity**	**Speaker(s)**	**Germany Time**
8:00-8:30	Participant Registration		16:00-16:30
8:30-9:30	Lecture 10: Vision Models	Dr. Boris Escalante (Mexico)	16:30-17:30
9:45-10:45	Lecture 11: Segmentation for Medical Images	Dra. Jimena Olvera (Mexico)	17:45-18:45
11:00-12:00	Lecture 12: Use Case: How Molecular Interaction Networks Make Machine Learning Robust and Interpretable	Prof. Dr. Tim Kacprowski (Germany)	19:00-20:00
12:15-13:00	Guided Preparation for Self-managed Learning Activities	HealthyAI & BrainMission Volunteers	20:15-21:00
	Free Time		
13:00	Launch Online: Self-managed Learning Activity 4	HealthyAI & MissionBrain Volunteers	21:00

Program of Activities
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Day Five: August 29, 2025 Location: Auditorium, IIMAS – UNAM			
México Time	**Activity**	**Speaker(s)**	**Germany Time**
8:00-8:30	Participant Registration		16:00-16:30
8:30-9:30	Lecture 13: Artificial intelligence applications in medicine and genomics	Dra. Alejandra Cervera (Mexico)	16:30-17:30
9:45-10:45	Panel discussion on the future of AI in Medical Informatics.	Dr. Thomas, Dra. Melissa Islas, Ron S. Leder	17:45-18:45
10:45-11:15	Closing Remarks and Future Outlook		18:45-19:15

Program Structure
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To promote meaningful international collaboration and knowledge exchange, each lecture in the Summer School is designed to last approximately 45 minutes. This format offers participants comparative insights into how similar technologies are developed and applied across different national and institutional contexts.

In addition, **"Launch Online: Self-managed Learning Activities"** will be introduced and guided by the **HealthyAI & BrainMission Volunteers**, offering participants a flexible way to deepen their knowledge and apply concepts independently.

To acknowledge participant commitment, a **Certificate of Attendance** will be issued to those who complete at least **80% of the live lectures** and submit **80% of the solved learning notebooks** by **Monday, 1st September 2025**.

Organizing Committee
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Fis. Jessica Huelgas Moreno

PhD. Professor Thomas Deserno

PhD. Helena Gómez Adorno