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Created: April 2024

Continuous monitoring of biomarkers and advances in computational modeling are opening new opportunities for understanding metabolic disorders and disease progression in soft biological tissues as well as enabling novel intervention and treatment protocols.
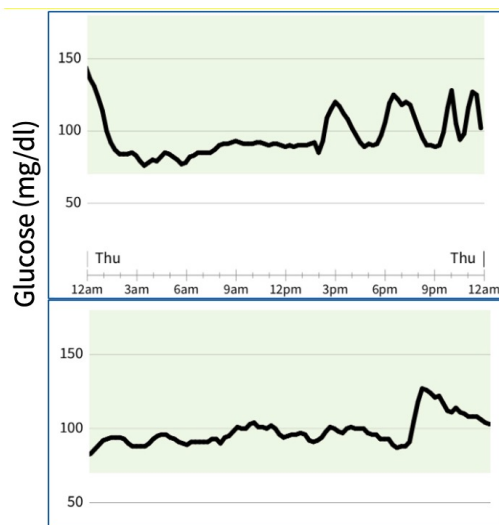
Research Interests

- Computational modeling of soft materials and biological tissues
- Population dynamics and epidemics
- Data Analysis and Machine learning
- Generative AI and Agent-based modeling

Current Projects

- Analysis of Covid-19 transmission data in k-12 and university campuses
- Data analysis of personalized gastro-intestinal motility
- Biofilm mechanics
- Data analysis of Continuous Glucose Monitors and metabolic disorder

Keywords

Data analysis, machine learning, computational mathematics, soft materials, diabetes, epidemics

Interest Areas for Collaboration/Future Work

Dr. Elbanna is interested in working with experts in metabolic diseases to conduct data analysis and physics-based modeling of metabolic disorders to discover driving mechanisms, identify precursors, and design interventions. Elbanna is also interested in the mechanical design of on-body soft electronics for continuous monitoring of biomarkers.