Call for Papers

BOOM: 5th International Workshop on
Biomedical infOrmatics with Optimization and Machine learning
in conjunction with the 29th International Joint Conference on Artificial Intelligence

Website: https://www.ijcai-boom.org/
Contact: ijcai1boom@gmail.com

On behalf of the organizing committee, we invite submissions of technical papers and abstracts for the 5th International Workshop on Biomedical Informatics with Optimization and Machine learning (BOOM) in conjunction with the IJCAI 2020, Yokohama Japan. We welcome submissions with important new theories, methods, applications, and insights at the intersection of artificial intelligence, machine learning, optimization, and biomedical informatics.

The BOOM workshop aims at catalyzing synergies among biomedical informatics, artificial intelligence, machine learning, and optimization. This workshop is targeting an audience of applied mathematicians, computer scientists, industrial engineers, bioinformaticians, computational biologists, clinicians and healthcare researchers who are interested in exploring the emerging and fascinating interdisciplinary topics. It is designed to foster the exchange of ideas between often-disparate groups that are unaware of each other's research, and to stimulate fruitful collaborations among different disciplines. In the past, **BOOM has been successfully held four times in conjunction with IJCAI (2016, 2017, 2018, 2019)**, featured keynote speakers from academia, federal agencies, medical practice, and corporates, successfully attracted a broad audience, and published journal special issues for accepted long articles.

Important Dates

- Submission Deadline: April 5, 2020
- Notification Due: April 20, 2020
- Final Version Due: May 10, 2020

Submission Guidelines

The BOOM Workshop solicits the following submissions:

- **Full papers** describing original research work that have not been published before, which will be published in a special issue of a partner journal (to be announced soon).
  - Full papers from past BOOM have been published in special issues of IISE Transactions on Healthcare Systems Engineering, 2018; EURASIP Journal on Advances in Signal Processing (JASP), 2017; and EURASIP Journal on Bioinformatics and Systems Biology (JBSB), 2016.
    - BOOM 2016: https://www.springeropen.com/collections/bioml
    - BOOM 2017: https://www.springeropen.com/collections/bioml2017
    - BOOM 2018: https://www.tandfonline.com/toc/uhse21/9/3?nav=tocList
  - Full-paper authors are also highly encouraged to submit **short abstracts** simultaneously **through email to: ijcai1boom@gmail.com** for the consideration of workshop presentations.
- **Short abstracts** that either highlight significant works that have been published or accepted recently or report unpublished research findings, which will be included in

workshop online proceedings (unarchived). Please format short abstracts according to IJCAI latex & word templates, with the page limit of 2 pages including references; and **submit through email to: ijcai1boom@gmail.com**

All submissions will be considered for oral and poster presentations at BOOM. The decision on presentation format will be based primarily on an assessment of breadth of interest, and the construction of balanced and topically coherent sessions, while full papers will be given some priority for oral presentations.

List of Topics

We invite submissions of technical papers and abstracts, with important new theories, methods, applications, and insights at the intersection of artificial intelligence, machine learning, optimization, and biomedical informatics. The topics of interest include, but are not limited to, the following inter-linked ones:

Category I: Machine Learning and Optimization Algorithms

- Developing and applying cutting-edge machine learning (e.g., deep learning) and optimization (e.g., large-scale optimization) techniques to tackle real-world medical and healthcare problems.
- Addressing challenges and roadblocks in biomedical informatics with reference to the data-driven machine learning, such as imbalanced dataset, weakly-structured or unstructured data, noisy and ambiguous labeling, and more.
- Designing novel, applicable numerical optimization algorithms for biomedical data, that is usually large-scale, high-dimensional, heterogeneous, and noisy.
- Re-visiting traditional machine learning topics such as clustering, classification, regression and dimension reduction, that find application values in newly-emerging biomedical informatics problems.
- Other closely-related disciplines, such as image processing, data mining, new computing technologies and paradigms (e.g., cloud computing), control theory, and system engineering.

Category II: Biomedical Informatics Applications

- Computational Biology, including the advanced interpretation of critical biological findings, using databases and cutting-edge computational infrastructure.
- Clinical Informatics, including the scenarios of using computation and data for health care, spanning medicine, dentistry, nursing, pharmacy, and allied health.
- Public Health Informatics, including the studies of patients and populations to improve the public health system and to elucidate epidemiology.
- mHealth Applications, including the use of mobile apps and wearable sensors for health management and wellness promotion.
- Cyber-Informatics Applications, including the use of social media data mining and natural language processing for clinical insight discovery and medical decision making.

Invited Speakers

- **Dr, Dursun Delen**, Regents Professor and Patterson Foundation Chair
  Department of Management Science & Information Systems
  Oklahoma State University, USA
  Topic: Revolutionizing the Health Care with Data Science and Predictive Analytics

- **Dr. Kang Li**, Associate Professor of Orthopaedics
  New Jersey Medical School, Rutgers
  The State University of New Jersey, USA.
  Topic: TBD

- **Dr. Tongliang Liu**, Lecturer in Machine Learning
  School of Computer Science
  University of Sydney, Australia.
  Topic: TBD

- **Dr. Gang Niu**, Research Scientist
  RIKEN Center for Advanced Intelligence Project, Japan
  Topic: Robust learning against label noise

Committees

- Bing Yao, Oklahoma State University
- Zhangyang Wang, Texas A&M University
- Huimin Lu, Kyushu Institute of Technology
- Yang Shen, Texas A&M University
- Jiayu Zhou, Michigan State University
- Shuai Huang, University of Washington

Contact

All questions about submissions should be emailed to: ijcai1boom@gmail.com

Websites

- BOOM Workshop: https://www.ijcai-boom.org/
- IJCAI Conference: https://ijcai20.org/