

Special Issue of Big Biomedical Data in Deep Learning Models  
On Measurement

Due to the proliferation of biomedical imaging modalities such as Photoacoustic Tomography, Computed Tomography (CT), Optical Microscopy and Tomography, Single Photon Emission Computed Tomography (SPECT), Magnetic Resonance (MR) Imaging, Ultrasound, and Positron Emission Tomography (PET), Magnetic Particle Imaging, EE/MEG, Electron Tomography and Atomic Force Microscopy, massive amounts of biomedical data are being generated on a daily basis. How can we utilize such big data to build better health profiles and better predictive models so that we can better diagnose and treat diseases and provide a better life for humans? In the past years, many successful learning methods such as deep learning were proposed to answer this crucial question, which has social, economic, as well as legal implications.

Several significant problems plague the processing of big biomedical data, such as data heterogeneity, data incompleteness, data imbalance, and high dimensionality. What is worse is that many data sets exhibit multiple such problems. Most existing learning methods can only deal with homogeneous, complete, class-balanced, and moderate-dimensional data. Therefore, data preprocessing techniques including data representation learning, dimensionality reduction, and missing value imputation should be developed to enhance the applicability of deep learning methods in real-world applications of biomedicine.

This special issue aims to provide a forum for a diverse, but complementary, set of contributions to demonstrate new developments and applications that cover existing above issues in data processing of big biomedical data. We would also like to accept successful applications of the new methods, including but not limited to data processing, analysis, and knowledge discovery of big biomedical data.

Topics:

- Feature extraction by deep learning or sparse codes for biomedical data
- Data representation of biomedical data
- Dimensionality reduction techniques (subspace learning, feature selection, sparse screening, feature screening, feature merging, etc.) for biomedical data
- Information retrieval for biomedical data
- Kernel-based learning for multi-source biomedical data
- Incremental learning or online learning for biomedical data
- Data fusion for multi-source biomedical data
- Missing data imputation for multi-source biomedical data
- Data management and mining in biomedical data
- Web search and meta-search for biomedical data

- Biomedical data quality assessment
- Transfer learning of biomedical data

#### Important Dates:

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|---|-------------------|
| Date when author invitations were or will be sent   | <i>15.7.2020</i>  |
| <b>The date the first paper is expected</b> (submission portal will be open from this date)   | <i>15.10.2020</i> |
| <b>The submission deadline:</b> the date by which all papers should be submitted to the Guest Editors for review and the EM submission site will be closed. | <i>15.1.2021</i>  |
| <b>The acceptance deadline:</b> the date by which all manuscripts should be fully reviewed and final decisions made on all manuscripts                      | <i>15.10.2021</i> |

#### Submission instructions:

The submission system will be open around one week before the first paper comes in. When submitting your manuscript please select the article type “VSI: **B2DDL**”. Please submit your manuscript before the submission deadline.

All submissions deemed suitable to be sent for peer review will be reviewed by at least two independent reviewers. Once your manuscript is accepted, it will go into production, and will be simultaneously published in the current regular issue and pulled into the online Special Issue. Articles from this Special Issue will appear in different regular issues of the journal, though they will be clearly marked and branded as Special Issue articles.

Please see an example here: <https://www.sciencedirect.com/journal/science-of-the-total-environment/special-issue/10SWS2W7VVV>

Please ensure you read the Guide for Authors before writing your manuscript. The Guide for Authors and the link to submit your manuscript is available on the Journal's homepage.

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