

## Advanced Decision Support Systems for Efficient Diagnosis of Gynaecological Cancers

Guest Editor(s)



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Dear Colleagues,

Artificial intelligence (AI) and machine learning (ML) methods have recently shown outstanding performance in numerous domains, from business analytics to healthcare. Although every scientific field is important, healthcare sciences are particularly special and vital. This importance is obviously due to certain practical reasons. The study of the healthcare sciences lends important insights into disease processes, and allows the development of novel therapeutics and innovative diagnostic methods, thereby directly improving human health. In the case of gynaecological cancers like ovarian, vaginal, cervical, vulvar, and uterine cancers, the conventional diagnostic methods and approaches are expensive and require a high level of equipment and medical expert intervention. Therefore, to overcome these challenges there is a dire need of developing automated diagnostic systems using advanced decision support systems. Owing to the above-discussed facts, many AI and ML researchers have attempted the development of decision support systems by exploiting computational and mathematical methods for the automated diagnosis of gynaecological cancers.

The widely used computational methods include neural networks, decision trees, support vector machines, etc. These computational methods are mainly responsible for the automated detection of gynaecological cancers or other diseases. On the other hand, during the training process, we need to train these models using mathematical optimization methods like Genetic Algorithms, Particle Swarm Optimization, and other heuristic methods. The optimally developed computational models offer better generalization compared with non-optimized models. However, these automated methods still suffer from the problem of lack of generalization during real-time testing on new data; which could be mainly due to the lower size of data used for training or inappropriate validation approaches. Therefore, these models are yet to be improved to the level they can be deployed for real-time life applications. This special issue is proposed to attract new ideas and applications of state-of-the-art computational and mathematical methods that will help develop automated diagnostic methods for the efficient diagnosis of gynaecological cancers. Such automated methods can be deployed for real-time applications. The special issue will cover a wide range of topics, including but not limited to:

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- Decision support systems for the diagnosis of gynaecological cancers
- Advanced computational methods for gynaecological cancers detection
- Heuristic algorithms based optimized diagnostic systems for gynaecological cancers
- Swarm Intelligence for efficient diagnosis of gynaecological cancers
- Genetic algorithm for optimized decision support systems
- Knowledge extraction for gynaecological cancers
- Knowledge learning for gynaecological cancers
- Big data for gynaecological cancers
- Visualization techniques of high-dimensional gynaecological cancers data
- Novel mathematical and statistical approaches based diagnostic systems for gynaecological cancers

**Key Words:** Computational and Mathematical Methods; Gynaecological Cancers; Machine Learning; Optimization Algorithms

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