## World Congress on

# Infertility, Gynecology, Reproductive Health November 28-29, 2024 | Dubai, UAE

Volume: 14

# Sperm Abnormality Detection Using Sequential Deep Neural Network

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Sperm morphological analysis (SMA) is an essential step in diagnosing male infertility. Using images of human sperm cells, this research proposes a unique sequential deep-learning method to detect abnormalities in semen samples. The proposed technique identifies and examines several components of human sperm. In order to conduct this study, we used the online Modified Human Sperm Morphology Analysis (MHSMA) dataset containing 1540 sperm images collected from 235 infertile individuals. For research purposes, this dataset is freely available online. To identify morphological abnormalities in different parts of human sperm, such as the head, vacuole, and acrosome, we proposed sequential deep neural network (SDNN) architecture. This technique is also particularly effective with low-resolution, unstained images. Sequential deep neural networks (SDNNs) demonstrate high accuracy in diagnosing morphological abnormalities in the given dataset in our tests on the benchmark. Our proposed algorithm successfully detected abnormalities in the acrosome, head, and vacuole with an accuracy of 89%, 90%, and 92%, respectively. It is noteworthy that our system detects abnormalities of the acrosome and head with greater accuracy than current state-of-the-art approaches on the suggested benchmark. On a low-specification computer/laptop, our algorithm also requires less execution time. Additionally, it can classify photos in real time. Based on the results of our study, an embryologist can quickly decide whether to use the given sperm.

#### **Biography**

Suleman shahzad, Born in 1989 and he is a distinguished academic and entrepreneur with expertise in computer science, renewable energy, and electric vehicles. After earning a Bachelor's (2011) and Master's (2015) in Computer Science, he completed his Ph.D. in 2023, making significant contributions to research. Currently, he serves as the Head of the Computer Science Department at Superior University, engaged in advanced and classified research Beyond academia, he is the founder of Solar Genius, a company promoting sustainable energy solutions, and is actively involved in assembling electric cars and bikes. His career seamlessly integrates technology, innovation, and entrepreneurship, driving progress in multiple industries.

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