

# IVF success rate poised to improve with new research

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Over the past three years, Canadian women desperate to conceive a child endured more than 82,000 attempts to become impregnated using in vitro fertilization (IVF), a reproductive technique that fertilizes a woman's eggs outside of her body.

IVF's live birth outcome is between five and 40 per cent, based on the patient's age. That statistic, coupled with an average cost of \$10-12,000 per treatment cycle, and the unpredictable emotions that women experience while taking fertility drugs, mean that there is a limit to how many treatments a patient can afford, or endure.

New research from SFU engineering science professor Parvaneh Saeedi, however, could revolutionize IVF success rates.

An expert in [digital image processing](#) and computer vision, she has spent the past four years working with the Pacific Centre for Reproductive Medicine (PCRM) to develop machine vision software that could help improve fertility treatments.

Currently, embryologists must observe an embryo's development over five days before selecting the best ones for transfer to the uterus. To do this, they must remove each embryo from an incubator once a day and study it under a microscope, a time-consuming and subjective process that can potentially harm fragile embryos.

Saeedi's research is moving IVF in a new direction.

In a quest to determine which developmental attributes best predict a successful clinical pregnancy, she first developed complex algorithms to analyze and process hundreds of images of embryos with confirmed pregnancy outcomes.

So far, she has created software that can automatically identify two important embryonic structures: the placenta-to-be (the trophectoderm) and the fetus-to-be (the inner cell mass). These two structures are essential in determining an embryo's viability.

Now, Saeedi is developing algorithms capable of processing thousands of real-time images of the developing embryos to find, mark and separate those with the highest implantation potential.

"IVF is a costly and emotionally difficult process for women who have delayed pregnancy, or have had difficulties becoming pregnant," says Saeedi.

"Using digital image processing adds objectivity and automation to embryo analysis and grading. I'm hoping it will increase the likelihood of IVF success while decreasing the number of treatment cycles for each patient."

Provided by Simon Fraser University

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