

Data-Driven Prediction of Embryo Implantation Probability Using IVF Time-lapse Imaging

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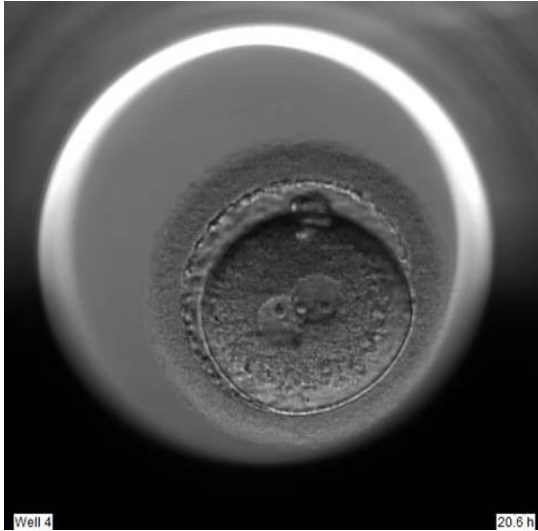
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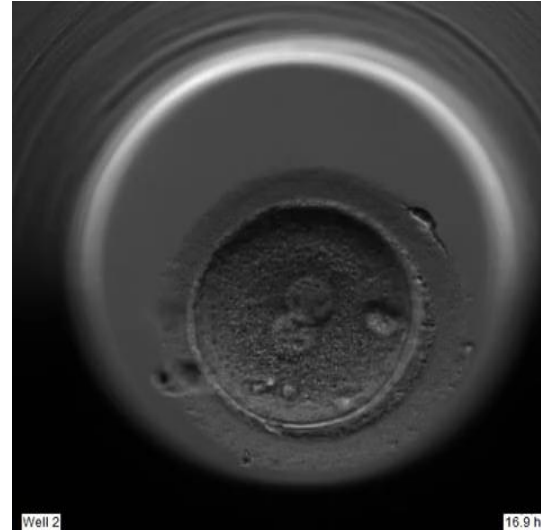
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Introduction

Standard of care grading: high grade
Ubar prediction: failure
Actual: no implantation



Standard of care grading: low grade
Ubar prediction: success
Actual: live birth



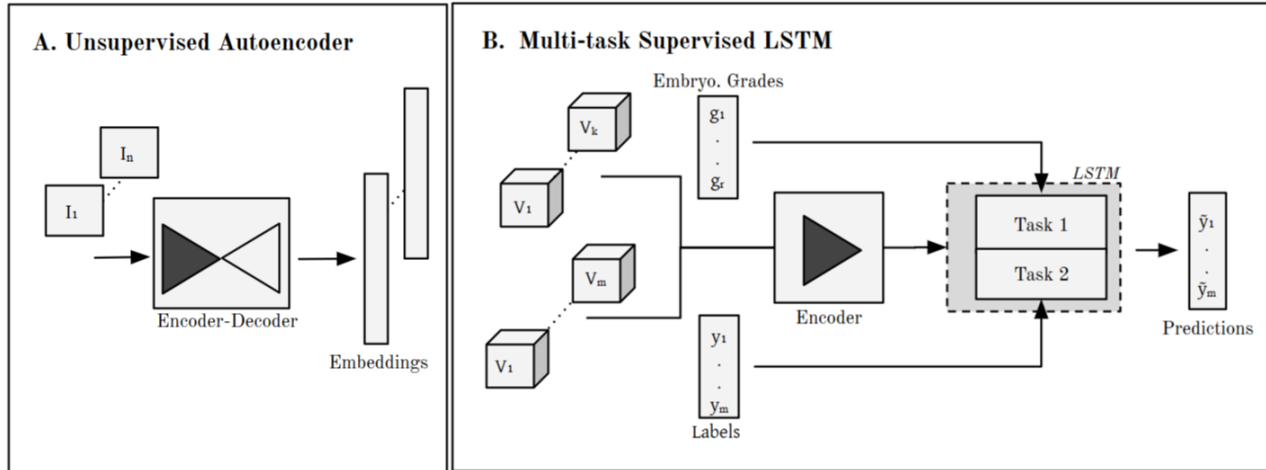
Methods

Data:

8000 time-lapse videos

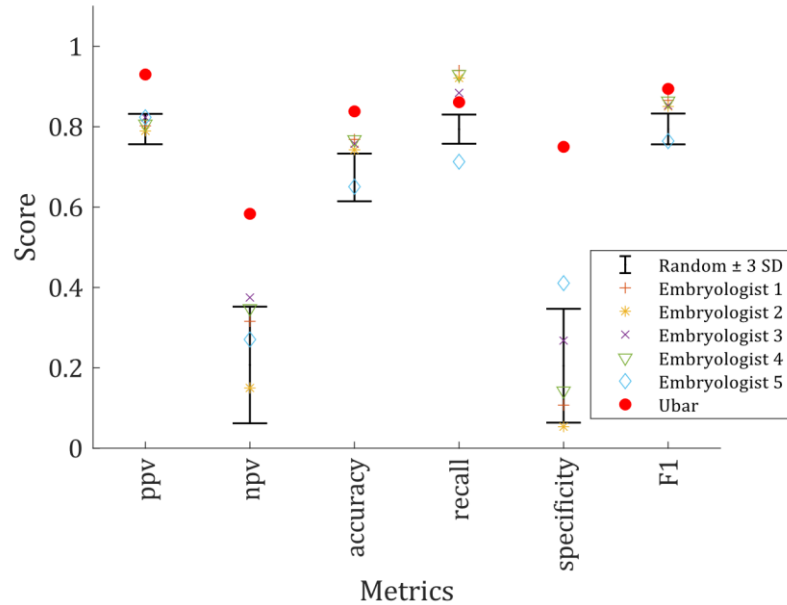
4000 videos graded embryologist

300 videos with known implantation data



Results

Ubar version 0.717 outperforms embryologists in any classification metric

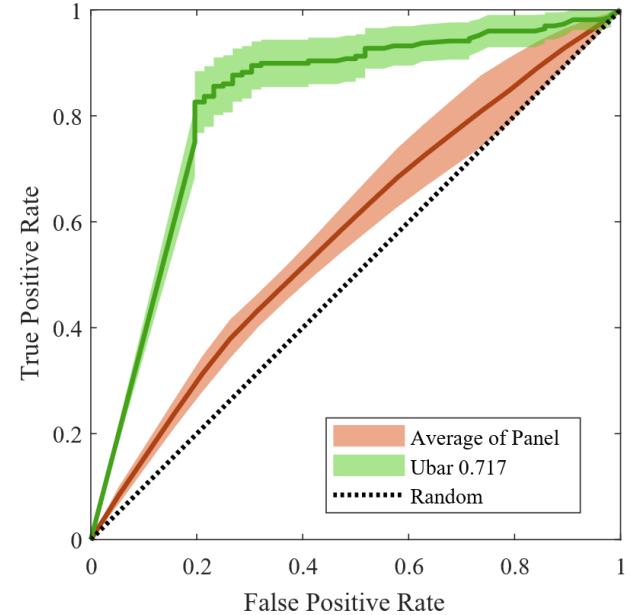


Average Embryologists Score (threshold = 3)

True Class	false	13	43
	true	38	178
		false	true
		Predicted Class	

Ubar Version 0.717 (threshold = 0.5)

True Class	false	42	14
	true	30	186
		false	true
		Predicted Class	



Random:

Generating 1000 shuffles of the ground-truth vector, results in classifiers with distribution the same as the data.

Conclusion & future work

Ubar significantly outperforms a panel
of expert embryologists

Future work:

- More data
- More balanced data
- Patient and embryo genetic data
- Statistically meaningful prediction confidence
- Pixel-level interpretability of the prediction

THANK YOU!

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