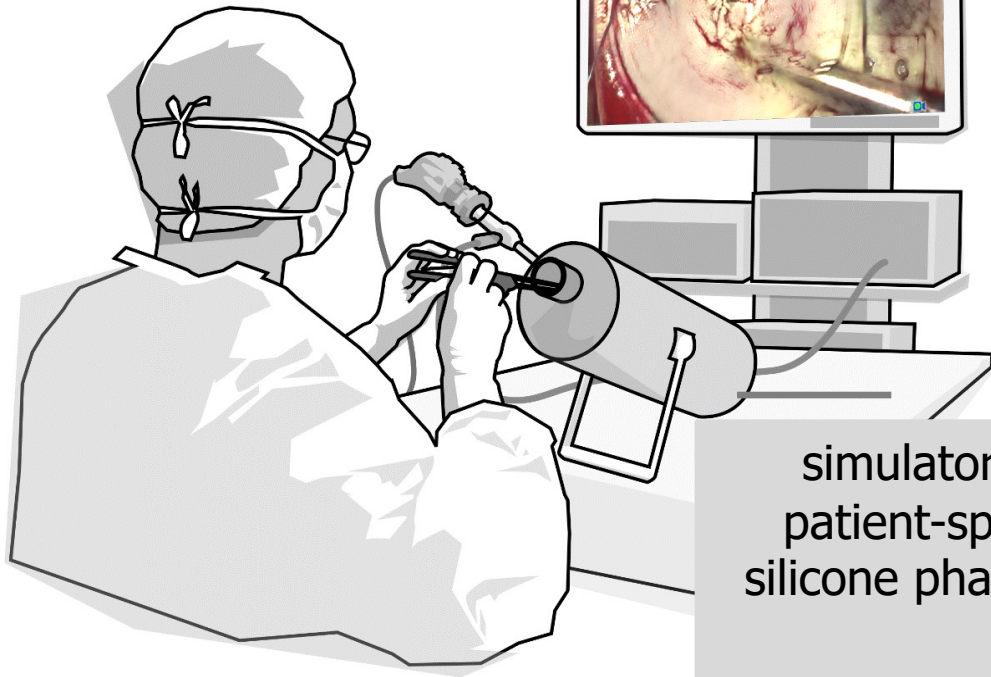
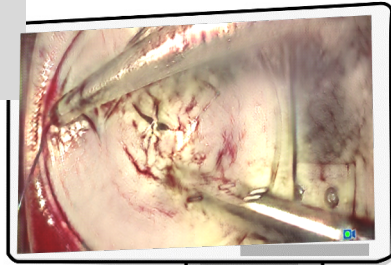


Quantitative endoscopic image analysis

„Hyperrealism“

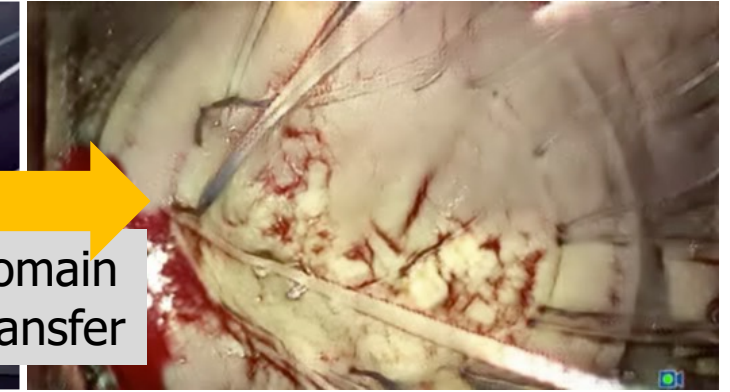
augmented
reality



surgical simulator domain



intra-operative domain



domain
transfer

simulator with
patient-specific
silicone phantom



Quantitative endoscopic image analysis

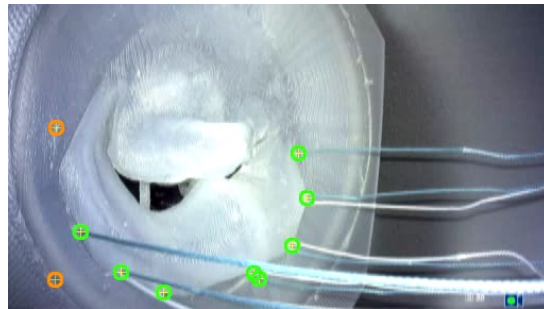


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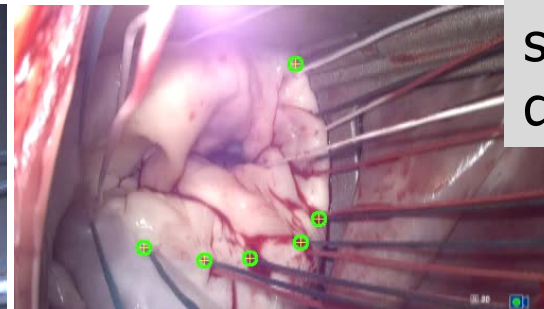
Informatics for Life



sim domain



intra-op domain



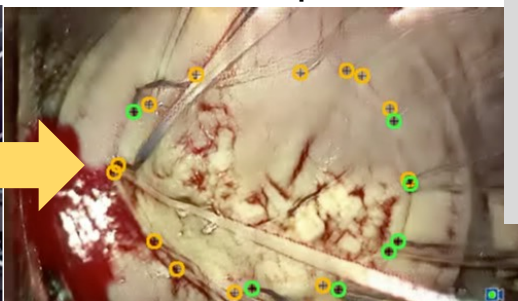
suture
detection

Sharan L., et al., "Point detection through multi-instance deep heatmap regression for sutures in endoscopy", (Under review, IJCARS 2021)

sim domain



fake intra-op domain

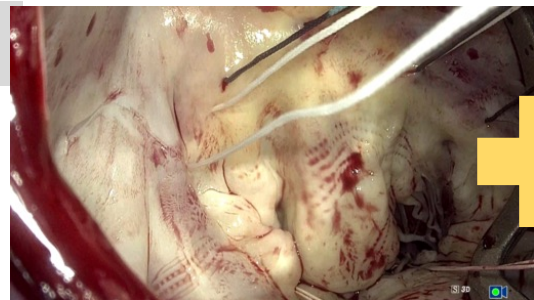


domain-transfer
+
reinforcement from
suture detection

Sharan L., et al., "Mutually improved endoscopic image synthesis and landmark detection in unpaired image-to-image translation", (Under review, IEEE-JBHI 2021)

1.

2.



real intra-op data



generated fake intra-op data

train suture
detection with
real + fake
data

unseen intra-op data



improved
suture
detection

Quantitative endoscopic image analysis

- Surgical data is highly heterogenous
- Data privacy and data security makes it difficult to acquire intra-op data
- Quantitative analysis helps in surgical training, feedback and planning



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Informatics for Life

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DFG Deutsche
Forschungsgemeinschaft

<https://adaptor2021.github.io> | MICCAI 2021

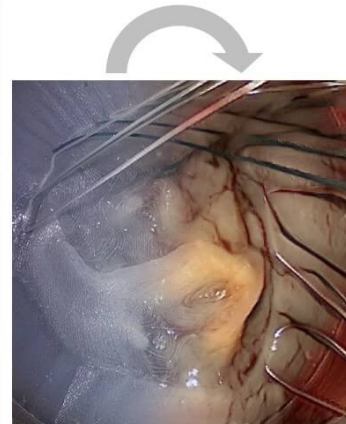
Adap \leftrightarrow OR

Deep Generative Model Challenge for
Domain Adaptation in Surgery



Simulation Domain

OR Domain



MICCAI2021

<https://adaptor2021.github.io>

**Artificial Intelligence in
Cardiovascular Medicine**
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