

# DOMINIK RIVOIR




PhD Student in Computer Vision for Computer-assisted Surgery working on Video Understanding and Neural Rendering for Surgical Applications.

 Dresden, Germany     [dominik.rivoir@nct-dresden.de](mailto:dominik.rivoir@nct-dresden.de)     [dominikrivoir.github.io](https://github.com/dominikrivoir)     <https://www.linkedin.com/in/dominik-rivoir-542764200/>  
 <https://scholar.google.de/citations?user=MBADUf0AAAAJ>     [@DominikRivoir](https://twitter.com/DominikRivoir)     [gitlab.com/users/dmri/contributed](https://gitlab.com/users/dmri/contributed)

## RESEARCH INTERESTS & PROJECTS

### Unsupervised Neural Rendering for Video Synthesis

- **Goal:** Rendering realistic, view-consistent and diverse video sequences from simulated surgical 3D scenes in unpaired/unsupervised learning settings.
- **Interests:** Neural 3D representations; Unpaired image translation; View consistency

 ICCV publication [2]     public code [a,b]     public dataset [c]  
 part of "Best of ICCV" selection in CV News [d]

### Surgical Procedural Video Understanding













- **Goal:** Investigating domain-specific challenges of procedural video understanding for surgical videos.
- **Interests:** End-to-end spatio-temporal modeling; Pitfalls of BatchNorm; Online recognition for real-time applications; Sparse events/annotations in untrimmed videos

 4 publications [1,3,4,5]     2 awards [h,i]     public code [e,k]

## EDUCATION





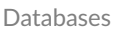
### PhD Student

#### National Center for Tumor Diseases (NCT)

-  June 2019 – ongoing, full-time     Dresden, Germany
- Advisor: Prof. Dr. Stefanie Speidel
  - Topic: "Adapting Procedural Video Understanding and Video Synthesis for Surgical Computer Vision"
  - Published at:  ICCV     MedIA     MICCAI     MICCAI-W
  - Reviewed for:  CVPR     ICCV     ECCV     MedIA     MICCAI     IPCAI ...

### Diploma in Computer Science (equiv. to M.Sc.)

**TU Dresden**     **GPA: 1.0**     **Awarded Best CS Graduate**

-  Oct 2013 – Apr 2019     Dresden, Germany
- Focus:  Machine Learning     CS Theory     Databases
  - Thesis: "Learning Representations for RSD Prediction through Unsupervised Temporal Video Segmentation"
  - Condensed thesis published as [4].

## ACTIVITIES

### Organizer

#### CVPR Workshop "Data Curation & Augmentation in Medical Imaging"





 Jun 2024     Seattle, USA  
<https://dca-in-mi.github.io/>

### Organizer

#### Summer School "AI Applications in Medicine"

 Sep 2023     Dresden, Germany  
<https://www.secai-ceti-summerschool.de/>

## AWARDS

-  **Outstanding Reviewer Award** 2022  
at MICCAI 2022  
(12 out of 1242 awarded) [f]
-  **Best Reviewer Award** 2022  
at IPCAI 2022  
(2 out of >100 awarded) [g]
-  **Best Paper Award** 2019  
at MICCAI 2019 workshop "OR 2.0"  
for "Unsupervised temporal video segmentation as an auxiliary task for predicting the remaining surgery duration" [h]
-  **Best Paper Award (2nd author)** 2019  
at IPCAI 2019 for "Active learning using deep Bayesian networks for surgical workflow analysis" [i]
-  **Lohrmann Medal** 2019  
as best graduate of TU Dresden's Computer Science department [j]

## SKILLS

### Machine Learning

- pytorch, tensorboard, opencv (very good)
- numpy, sklearn, pandas, matplotlib (very good)
- tensorflow, keras (basic)

### Programming Languages

- Python (very good)
- C++, Java (good)
- Rust, SQL, OWL, Cypher, Prolog (basic)

### Other Technologies




- Git, LaTeX, Blender, html, css, kivy

## LANGUAGES

English    2 years in USA '99-'01  
1 year in UK '12-'13  
4 months in USA '16  
TOEFL iBT score: 114/120

German    Native

## OTHER INTERESTS

 Baseball     Arthouse Cinema     Guitar

## REFERENCE

### Stefanie Speidel (advisor)

 [stefanie.speidel@nct-dresden.de](mailto:stefanie.speidel@nct-dresden.de)

## SELECTED PUBLICATIONS

---

[1] Rivoir, Dominik, et al. "On the Pitfalls of Batch Normalization for End-to-End Video Learning: A Study on Surgical Workflow Analysis." Medical Image Analysis. 2024.

MedIA (Impact Factor 10.7)

[2] Rivoir, Dominik, et al. "Long-term temporally consistent unpaired video translation from simulated surgical 3d data." IEEE/CVF International Conference on Computer Vision. 2021.

ICCV

[3] Rivoir, Dominik, et al. "Rethinking anticipation tasks: Uncertainty-aware anticipation of sparse surgical instrument usage for context-aware assistance." International Conference on Medical Image Computing and Computer-Assisted Intervention. Springer, Cham, 2020.

MICCAI

[4] Rivoir, Dominik, et al. "Unsupervised temporal video segmentation as an auxiliary task for predicting the remaining surgery duration." OR 2.0 Context-Aware Operating Theaters and Machine Learning in Clinical Neuroimaging. Springer, Cham, 2019.

🏆 Best Paper

[5] Bodenstedt, Sebastian, Rivoir, Dominik, et al. "Active learning using deep Bayesian networks for surgical workflow analysis." International journal of computer assisted radiology and surgery. 2019.

🏆 Best Paper

## LINKS

---

[a] [https://gitlab.com/nct\\_tso\\_public/surgical-video-sim2real](https://gitlab.com/nct_tso_public/surgical-video-sim2real)

[b] [https://gitlab.com/nct\\_tso\\_public/demo-video-sim2real](https://gitlab.com/nct_tso_public/demo-video-sim2real)

[c] <http://opencas.dkfz.de/video-sim2real/>

[d] [rsipvision.com/ComputerVisionNews-2021November/24/](https://rsipvision.com/ComputerVisionNews-2021November/24/)

[e] [https://gitlab.com/nct\\_tso\\_public/ins\\_ant](https://gitlab.com/nct_tso_public/ins_ant)

[f] <https://conferences.miccai.org/2022/en/OUTSTANDING-REVIEWER-AWARDS.html>

[g] [sites.google.com/view/ipcai2022/awards](https://sites.google.com/view/ipcai2022/awards)

[h] <https://twitter.com/SpeidelStefanie/status/1183310832580481024>

[i] <https://ipcai2019.github.io/#news>

[j] <https://tu-dresden.de/tu-dresden/newsportal/news/talente-frueh-unterstuetzen-tud-ehrt-beste-absolventinnen>

[k] [https://gitlab.com/nct\\_tso\\_public/pitfalls\\_bn](https://gitlab.com/nct_tso_public/pitfalls_bn)