



# DIY Challenge Blueprint: From Organization to Technical Realization in Biomedical Image Analysis

Leonard Klausmann', Tobias Rueckert', David Rauber', Raphaela Maerkl', Suemeyye R. Yildiran', Max Gutbrod', and Christoph Palm',

- I Regensburg Medical Image Computing (ReMIC). OTH Regensburg, Regensburg, Germany
- 2 Regensburg Center of Health Sciences and Technology (RCHST), OTH Regensburg, Regensburg, Germany
- 3 AKTORmed Robotic Surgery, Neutraubling, Germany

#### Abstract

Biomedical image analysis challenges are vital for benchmarking algorithms and sharing datasets. Commercial cloud platforms dominate, but entail high costs, limited flexibility, and reduced data control. We present a Do-It-Yourself (DIY) blueprint for hosting challenges on self-managed infrastructure, improving cost efficiency, compliance, and data sovereignty. The framework integrates organizational and technical aspects such as stakeholder roles, data management, identity and access management, containerized evaluation workflows, and modular open-source services. It provides a reusable foundation for future challenges, promoting autonomy, transparency, and sustainability.

#### Key Roles and Their Needs

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- »Straightforward registration and data access »Clear submission process for containerized solutions
- »Fast and reliable feedback on performance
- »Transparent leaderboard to track progress

#### Data Provider



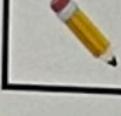
- »Provision of imaging data and annotations
- »Legal/ethical compliance and consent
- »Updates or corrections when needed

#### Challenge Organizer

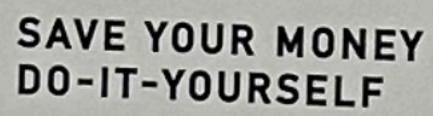


- »Infrastructure with fine-grained access control
- »Robust data security and GDPR compliance
- »Automated, reproducible evaluation pipelines
- »Managed participant accounts, roles, and permits
- »Transparent result presentation (leaderboards, reports)
- »Ethical approvals and data-sharing agreements

Authentification



Annotation





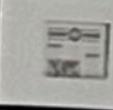
Data Sharing



Evaluation



Feedback



Public Relations



Storage



Submission

#### Case Study

- »MICCAI 2024 EndoVis PhaKIR Challenge
- »Fully self-hosted infrastructure
- »Multi-center endoscopic dataset
- »14 teams with 66 registrations
- »18 international submissions in 3 tasks

# SAVE YOUR MONEY



Take-Home-Message

compliance

»DIY challenge = feasible and low-cost

»Flexible and reproducible infrastructure

»Blueprint reusable by the community

»Greater data sovereignty and

### Workflow

#### ① Planning

#### Define

- » Ethics approvals
- » Data agreements
- » Clear tasks
- » Robust metrics

#### 2 Pre-Challenge

#### Prepare

- » Curated datasets
- » Infrastructure
- » Onboarding docs

### Execution

#### **Evaluate**

- » Participant registration
- » Secure data access
- » Container submissions

## 4 Feedback

#### Provide

- » Continuous support
- » Error handling
- » Dynamic leaderboard

# ⑤ Post-Challenge

### Publish and archive

- » Final results » Data/code
- » Joint paper

# Contact & Affiliations

⊠ leonard.klausmann@oth-regensburg.de



Connect with me on LinkedIn.

Regensburg Center of Health Science and Technology

