Current Activities

JEG-Hybrid

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How to reuse existing subjective datasets to deal with new challenges?

- **Primary result**: An algorithm to generate a HEVC-encoded PVS whose quality is expected to be quite similar to that of a subjectively evaluated AVC-encoded PVS

- **Main idea**: Exploiting the VQMs in their best application scenario, i.e., working with the same SRC and "quite similar" HRCs

- **Publication**:   L. Fotio Tiotsop, T. Mizdos, E. Masala, M. Barkowsky, P. Pocta, "How to Train No Reference Video Quality Measures for New Coding Standards using Existing Annotated Datasets?''. In Proceedings of the IEEE 23rd international Workshop on Multimedia Signal Processing (MMSP 2021)

- **Future**: AV1?

A "stamp" in scientific publications for reporting the training process and benchmarking of DNN-based VQMs

- **Motivations**: enhancing research reproducibility, enabling fair comparisons with appropriate statistics, guaranteeing fair review process, …
- **Goal**: Proposing a comprehensive (multi-category) "stamp" or template to be filled in by any author
  - Architecture details
  - Training and validation set details
  - Should we use a unique application-based test set?
  - Adjusted PLCC, SROCC and RMSE
  - A global index to compare two DNNs-based VQMs…
- **Publication**: Still at the early stage: potential collaborators are very welcome, VQEG SAM group very welcome for the statistical part!

AI-based Observers

- Working on designing NN-based virtual observers (AI Observers, AIOs) starting from existing subjectively-annotated image and video datasets;

- **Key point**: modeling SINGLE observers, which should allow to consider also their expectation

- **Challenges**: dealing with noisy labels in a context where large scale training sets are missing

- Our previous work used shallow NN on video content and DNN on still images

- **Current activity**: designing DNN-based AI Observers for video and comparing them to actual ones in terms of bias, inconsistency and MOS prediction

- **Next step**: designing subjective tests tailored for the training of ''highly accurate'' AI Observers

DNN-based AIOs bias and inconsistency

- We trained 27 DNN-based AIOs to mimic the observers that participated in the ITS4S experiment

- Each AIO was obtained by exploiting the ''JPEGResNet50'' and a transfer learning step on the ITS4S dataset

- The tests were then conducted on the VQEG HD3 dataset

- *The ratings of an AIO were computed, then the 'Sureal'' software was run, including the AIO as an additional subject*

- The AIO's bias and inconsistency were then compared to those of human subjects

Bias

AIOs Bias
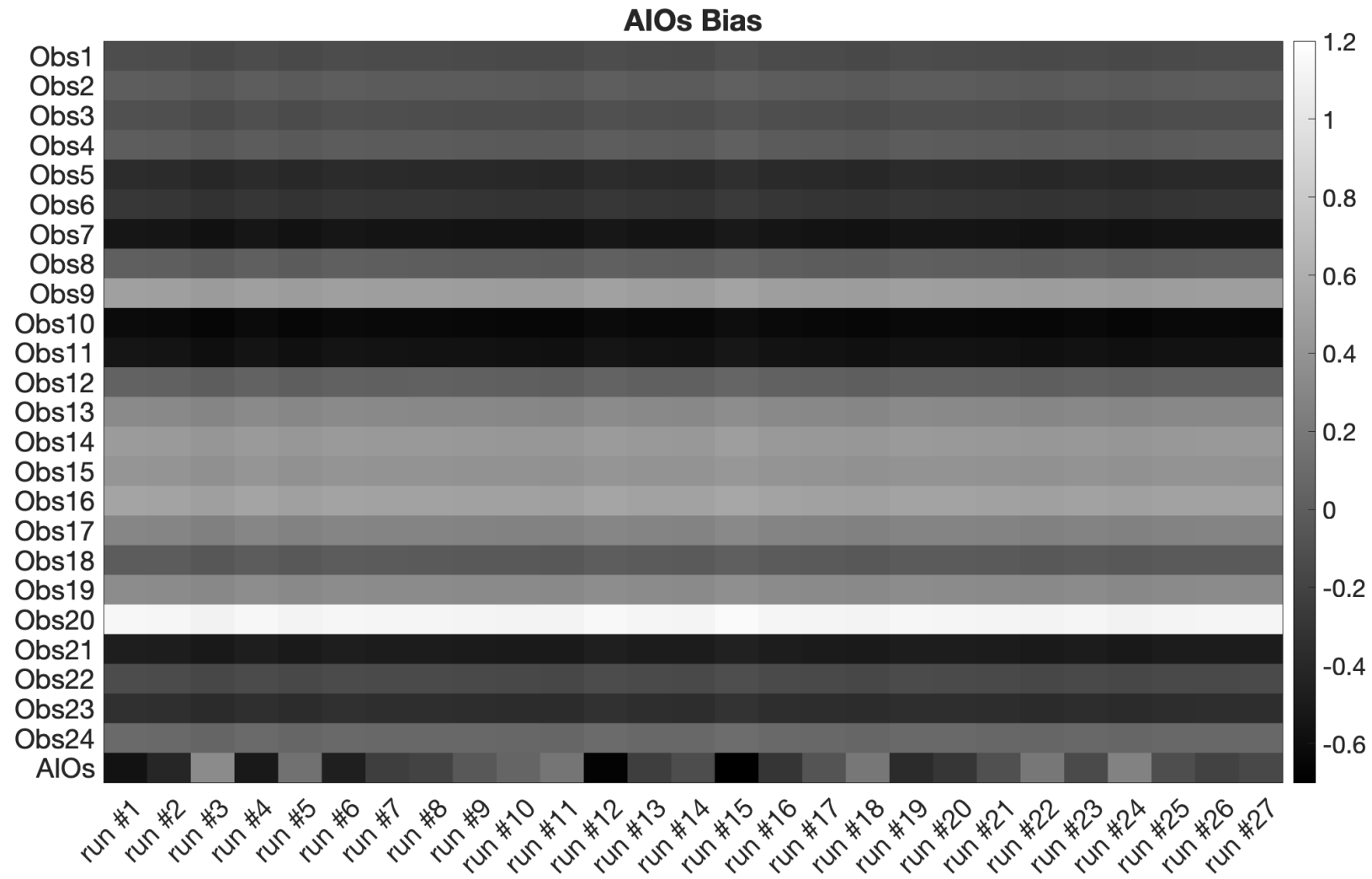
Each column shows the bias of the 24 human subjects and that of one AIO

Inconsistency

AIOs Inconsistency
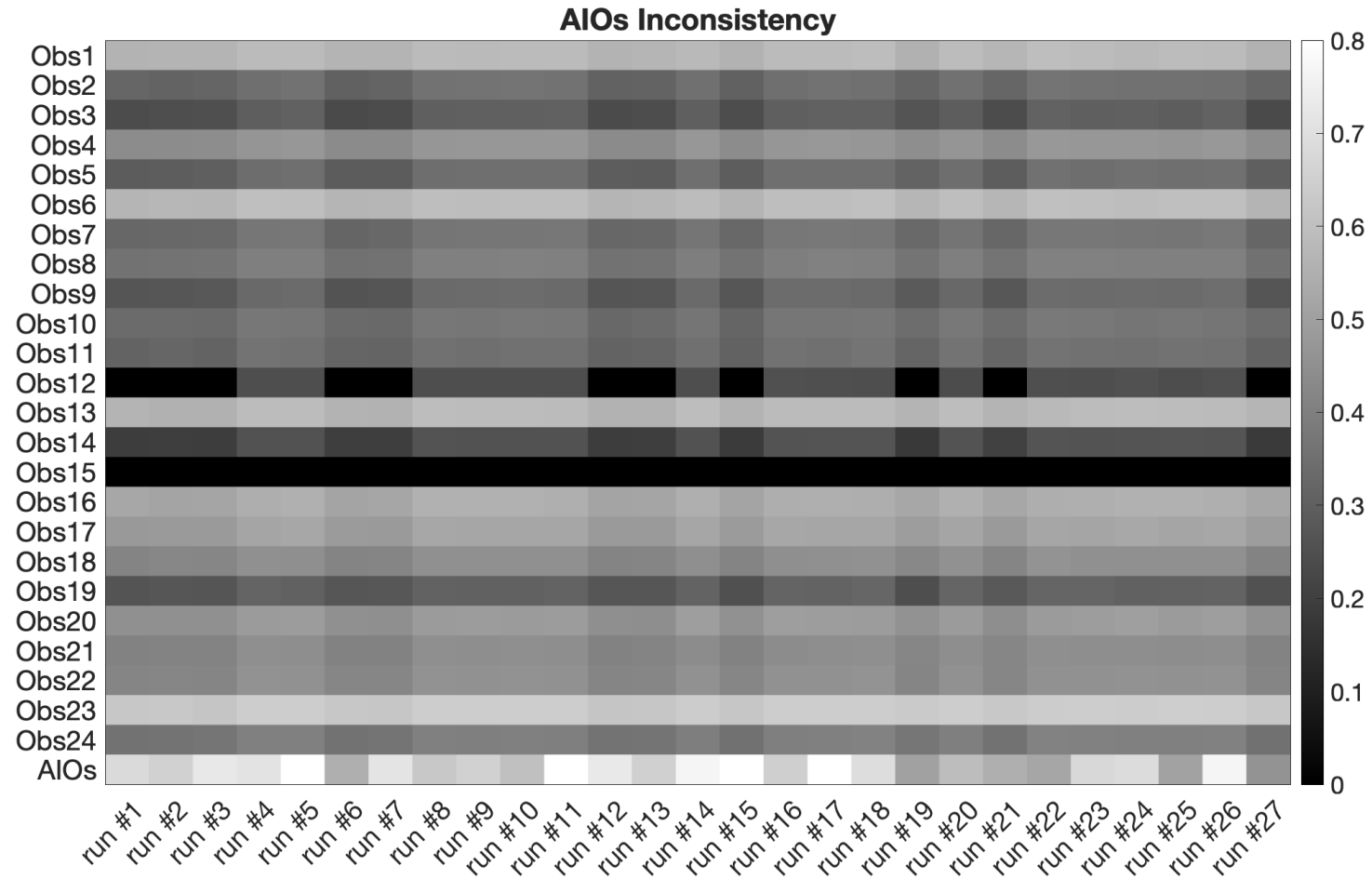
Each column shows the inconsistency of the 24 human subjects and that of one AIO

Publications

- L. Fotio Tiotsop, T. Mizdos, M. Barkowsky, P. Pocta, A. Servetti, E. Masala, "*Mimicking individual media quality perception with neural network based artificial observers*", In: ACM Transactions on Multimedia Computing, Communications, and Applications 2021

- L. Fotio Tiotsop, A. Servetti, T. Mizdos, P. Pocta, G. Van Wallendael, M. Barkowsky, E. Masala. "*Deep Neural Networks based Artificial Observers for No Reference Image Quality Assessment*", Signal Processing: Image Communication (SUBMITTED)

Thanks for your attention