

BATTLE-AMP

Benchmarking Assessment Tests for The Leading Efficacy of Antimicrobial Peptides

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E. Szczurek



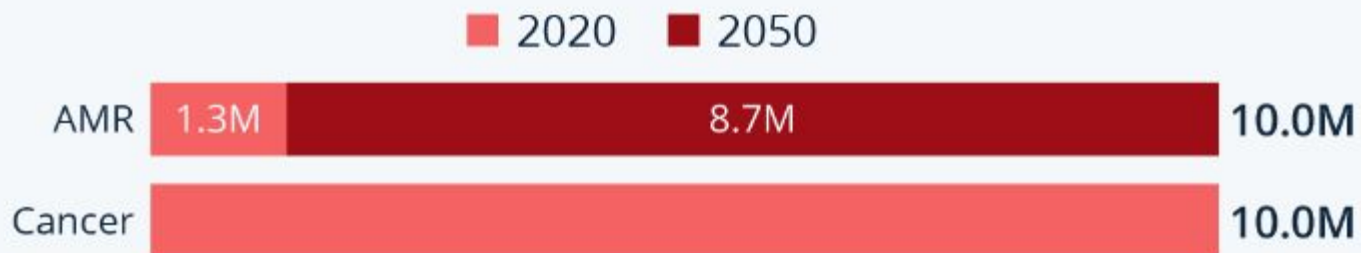
**Warsaw University
of Technology**

**HELMHOLTZ
MUNICH**



AMR

Predicted mortality from antimicrobial-resistant* infections (AMR) versus today's common causes of deaths



Challenges

Lack of standardization



datasets



state of the art

Low reproducibility and reusability

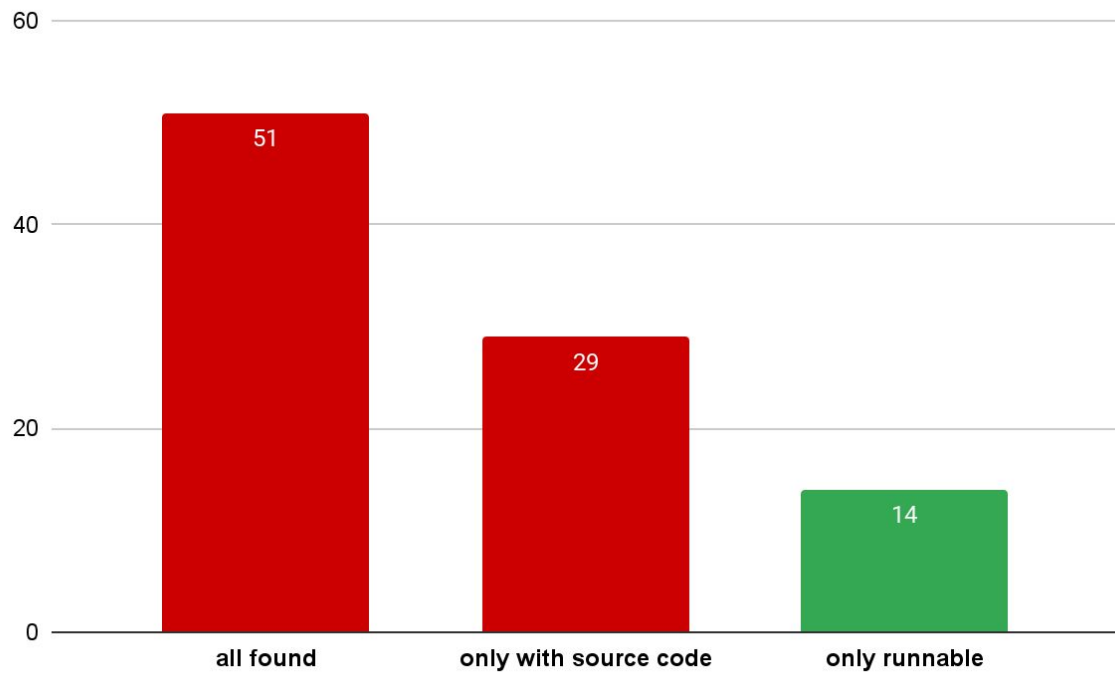


dependencies

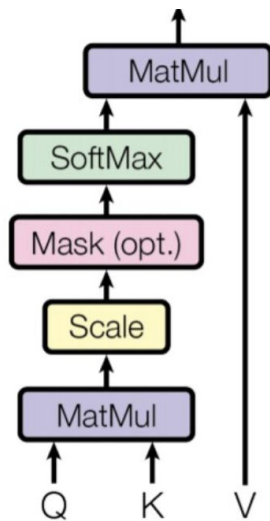
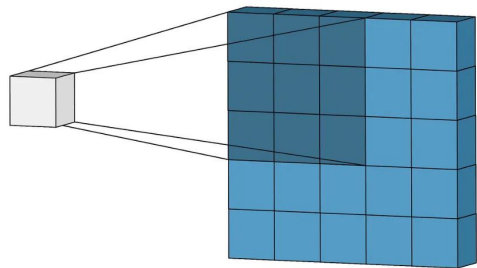
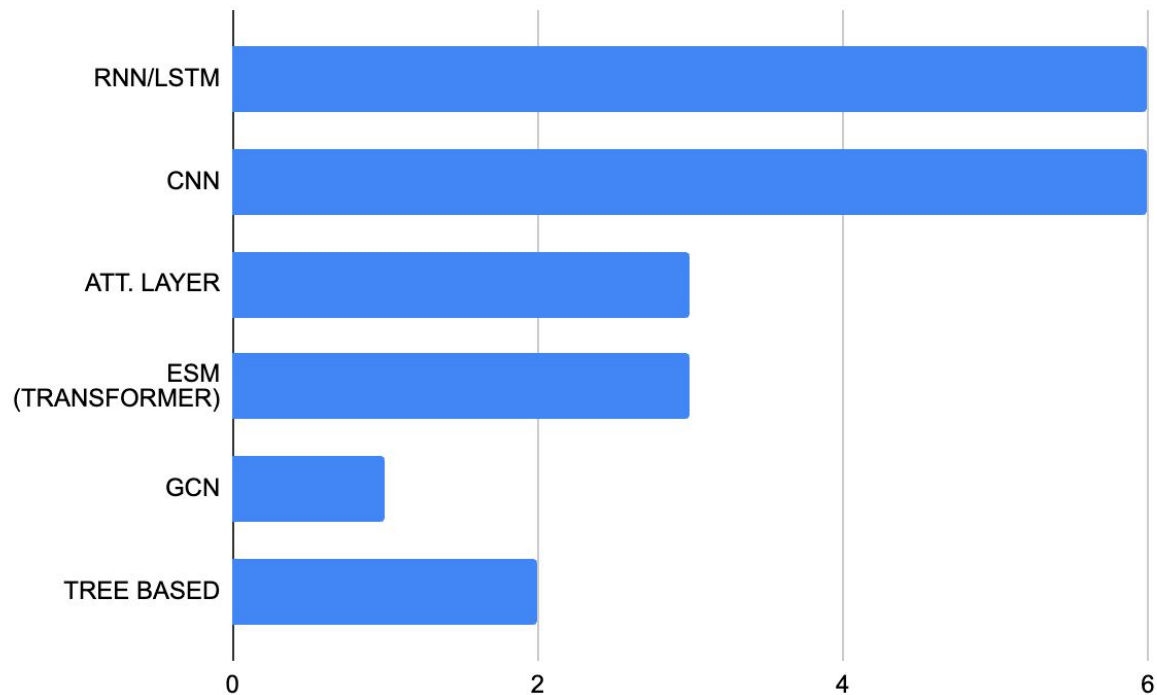


inference

Models availability

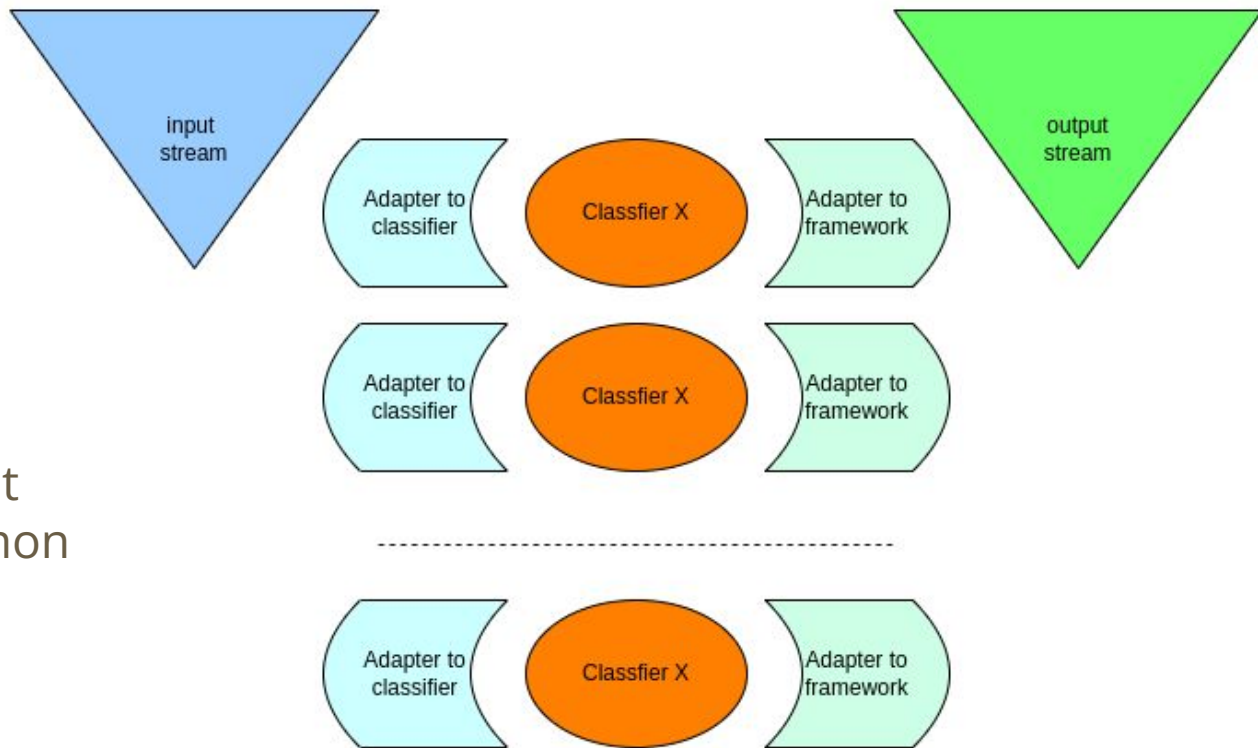


Architectures overview



Our benchmark

Wrapping model

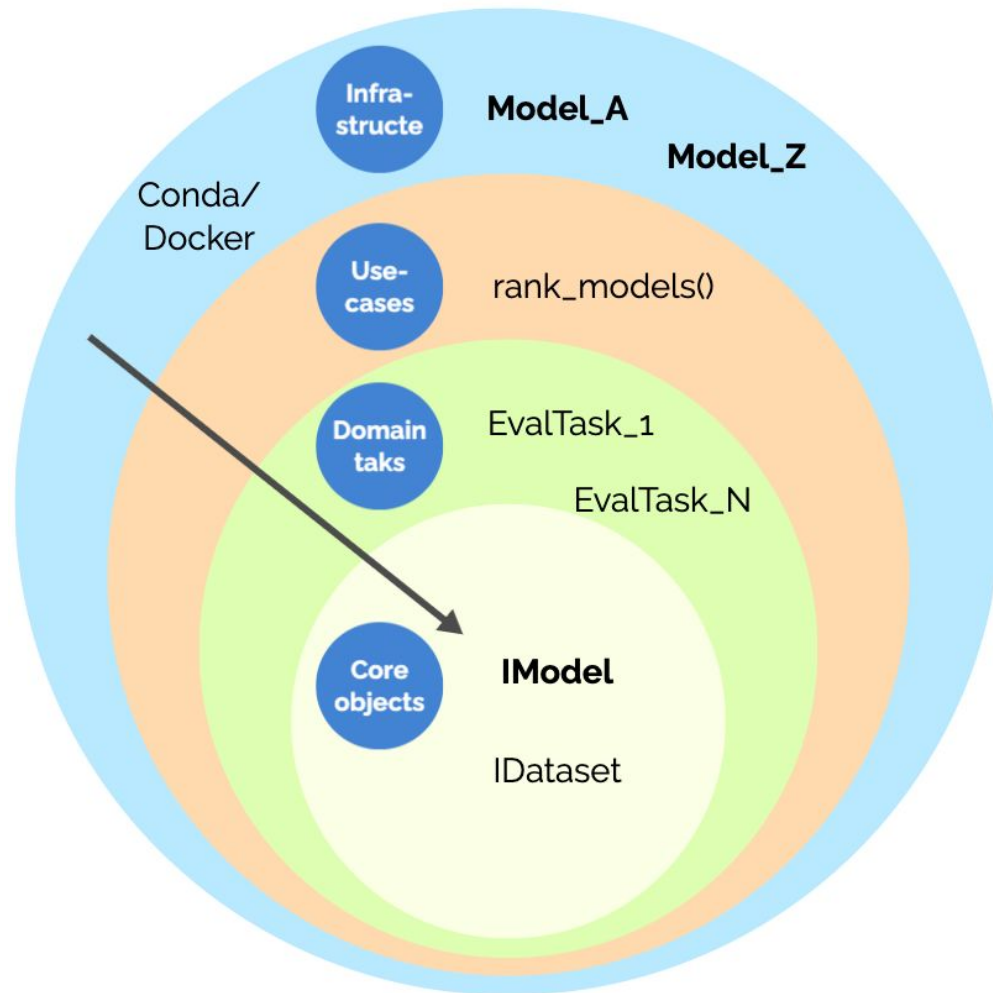


model's responsibility - inference

1. prepare environment
2. inference with common format

Extendable benchmark

benchmark's responsibility -
evaluation independ of
models



Labeling methods

AMP vs non-AMP

- if has been reported to AMP database
- binary classification

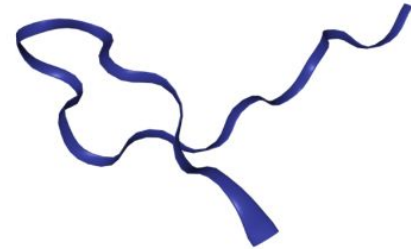
Activity measure

- measure describing inhibition of bacterial growth (the lower, the better)
- regression of continuous value
- classification via regression

Robustness evaluation

***robustness** refers to the ability of a system, model, or entity to maintain stable and reliable performance across a broad spectrum of conditions, variations, or challenges*

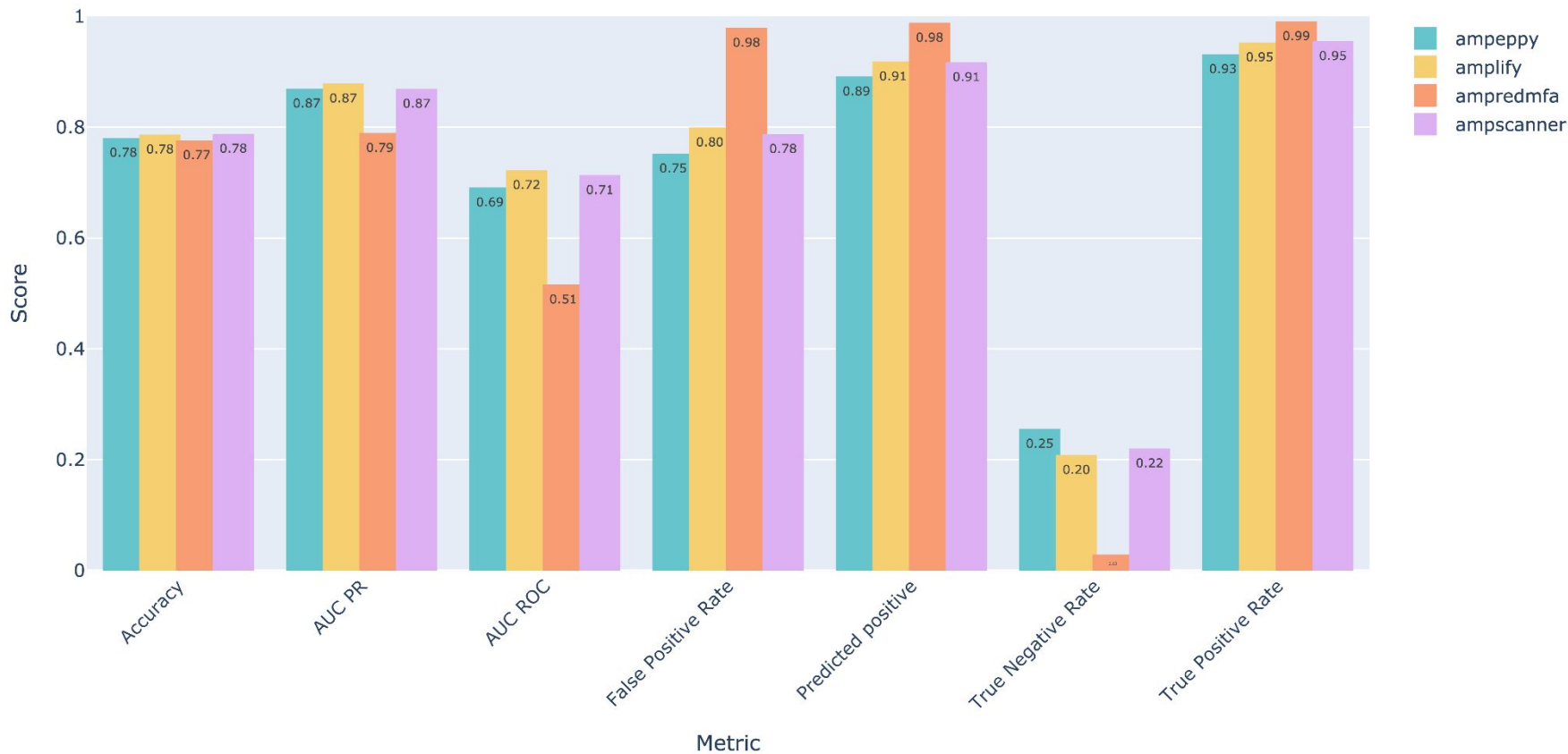
FLGVVFK**L**ASKVFPVFK**K**KV - 4 µg/ml
FLGVVFK**S**ASKVFPVFK**G**KV - >256 µg/ml



MIC *E. coli* = 256 µg/ml
MIC *S. aureus* = 8 µg/ml
FLGVVFKLASKVFGAVFKKV

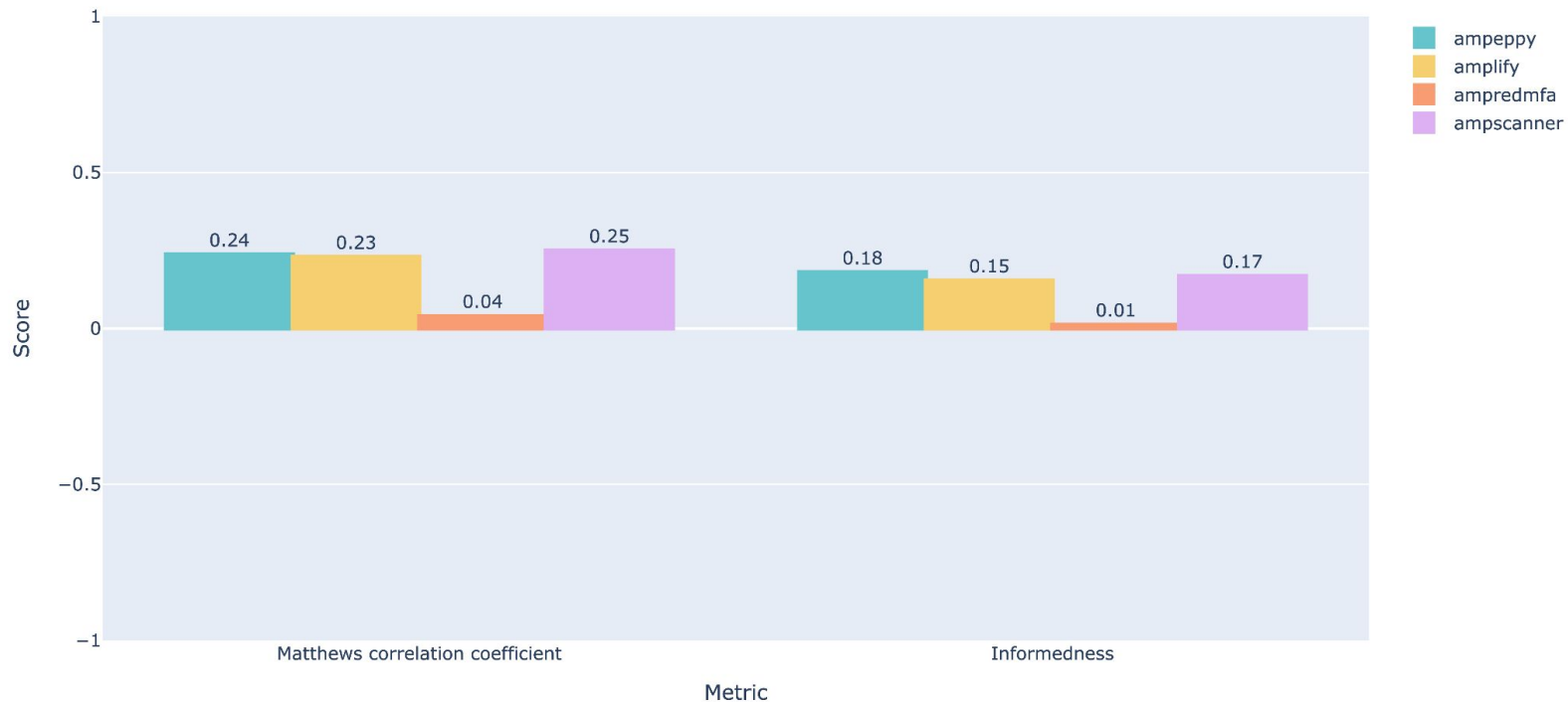
Excessive positive predictions

Model performance comparison - BroadActivityTask



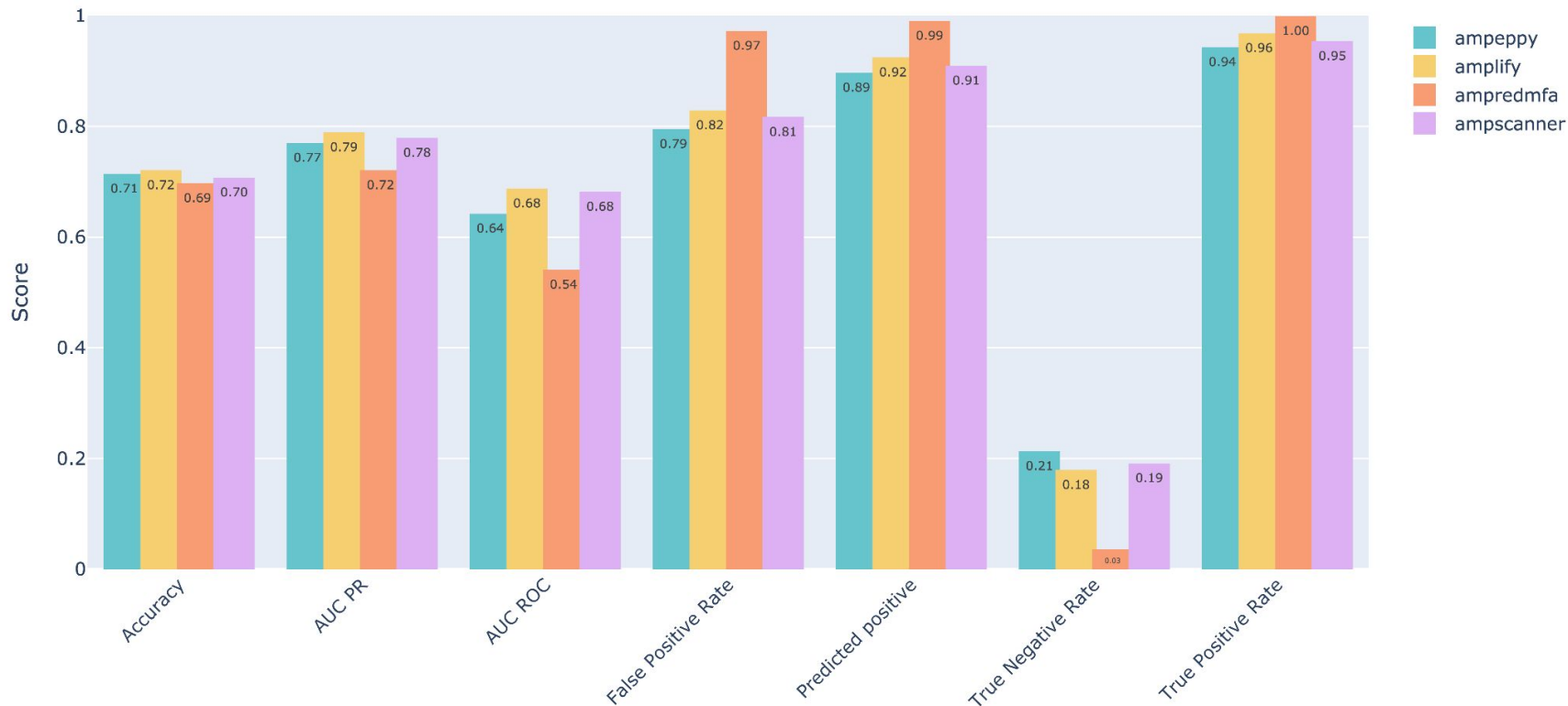
Inability to distuigh negatives

Model performance comparison - BroadActivityTask



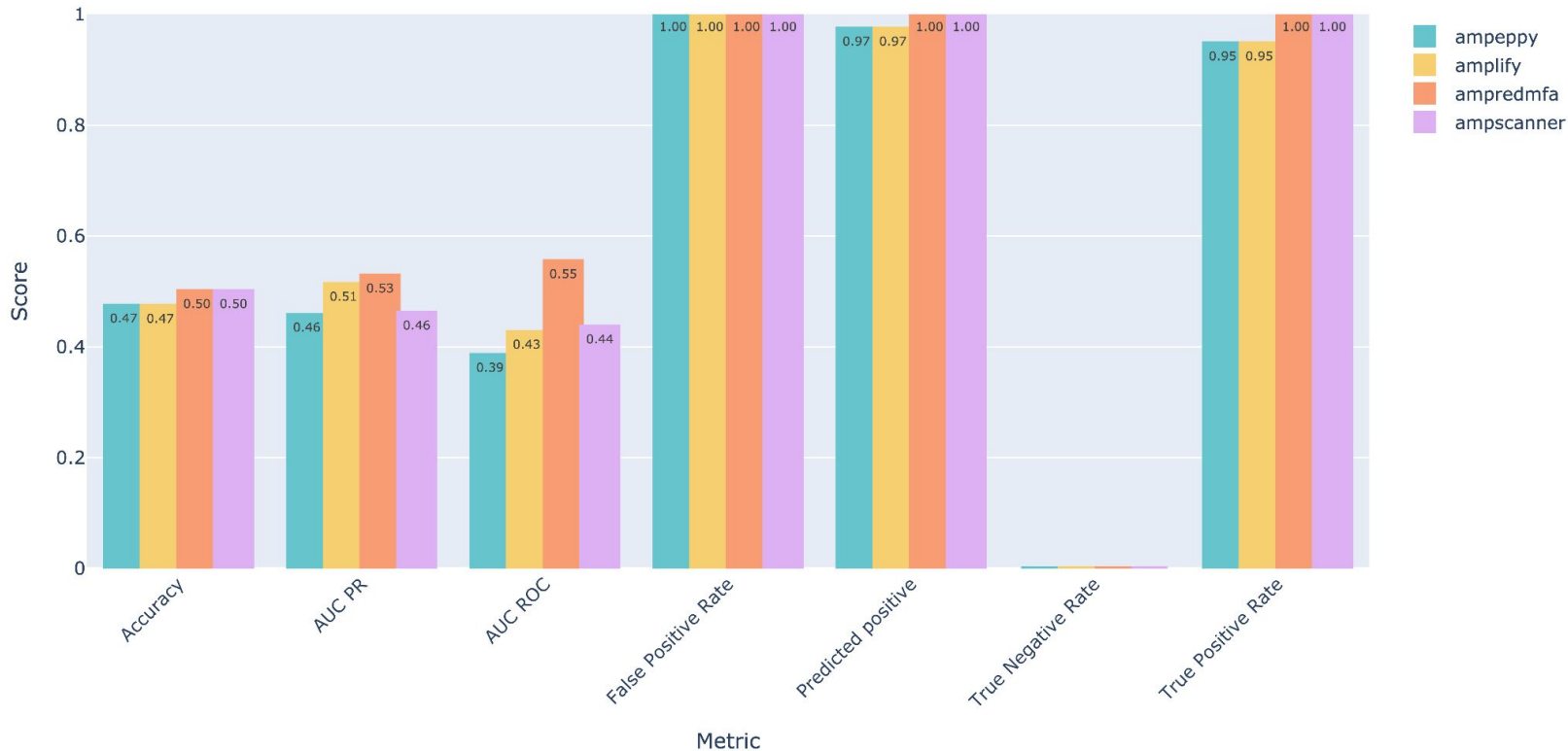
Issues with microbe specific predictions

Model performance comparison - SpeciesActivityTask Ecoli



Non-distinguishment of highly similar sequences

Model performance comparison - HighSimilarityTask



Acknowledgments



Paulina Szymczak



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Ewa Szczurek



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Jure Borišek



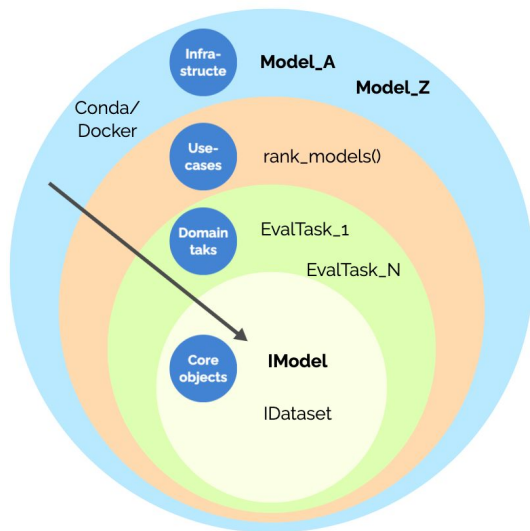
Piotr Setny



Julia Szkóp

BATTLE-AMP

- lack of standardization
- thread of AMR
- extendable benchmark



Poster session:

#62 BATTLE-AMP

📅 SATURDAY / 9 NOVEMBER

🕒 10:30 - 12:00 (POSTER SESSION 2)



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[/szczurek-lab/BattleAMP-benchmark](https://github.com/szczurek-lab/BattleAMP-benchmark)