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Beam size prediction at Bessy II with ML/AI

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Light sources are used by many users at the same time. Each user is able to adjust different settings, e.g. insertion device parameters. Light source operation tries to minimize their crosstalk, i.e. settings of one user should not change the beam of a different user. The vertical beam size is a parameter that should be tightly controlled.

Data reveals that the vertical beam size takes a long time for settling, after settings were changed. Thus, to model the parameter, it needs to be treated as a time-dependent problem.

In this talk, I describe the challenge to model the vertical beam size using machine learning methods, especially why LSTM cells should be used. I present which predictions have been reached reliably and what remains to be dealt with to provide it in user operation.

Summary

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Session Classification: Session 3: Controls/Seeding/DAQ

Track Classification: Beam controls