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ISMB 2018 Abstracts Submission 19

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Paper 19

Title:	Curriculum Learning Based on Sample Selection Using Posterior Probabilities
Track:	MLCSB COSI: Machine Learning in Computational and Systems Biology
Author keywords:	electroencephalogram (EEG) curriculum learning seizure detection deep learning
Abstract:	<p>Training of deep learning algorithms is highly dependent on the order of training samples. Various forms of curriculum learning have been proposed to reduce the sensitivity of the training process. The general concept behind curriculum learning is to use easy samples first and gradually introduce more complex samples. Identifying the difficulty level of samples is a major challenge. We propose a new data selection strategy based on using a less sensitive algorithm that excels at automatic segmentation to triage samples, rank the data based on posteriors generated in this first pass, and then proceed with training a more complex deep learning system using this derived ordering of the data. We use a hybrid hidden Markov model / Stacked denoising Autoencoder based system for the first pass, and a more powerful system based on a Convolutional Neural Network and a Long Short-Term Memory Network for the second pass. We demonstrate this strategy on a seizure detection task based on the TUH EEG Seizure Corpus. Our system produced a sensitivity 32.13% with 10 false alarm per 24 hours, which is very close to our overall best performance, yet is a robust process that can be easily applied to new tasks.</p>
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Submission Type	Poster Only
Abstract	Saeedeh Ziyabari

Presenting
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Abstract

CAMDA: Critical Assessment of Massive Data Analysis
MLCSB: Machine Learning in Computational and Systems Biology
TransMed: Translational Medical Informatics

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