Improving eligibility propagation using Izhikevich neurons in a multilayer RSNN.

Presentation 4: A bidirectional crossroads

Werner van der Veen
(w.k.van.der.veen.2@student.rug.nl)

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Work done since previous meeting

- ☑ Implement Bellec's tricks. Should be able to reproduce thereafter:
  - ☑ L2 & firing rate regularization
  - ☑ Firing rate regularization
  - ☑ Gaussian distribution for broadcast weights
  - ☑ Adam optimizer
- ☐ **Bidirectional network** (?)
- ☐ Obtain Bellec's performance.
- ☐ Experiment with my own tweaks (e.g. multi-layered).

Current system performance

- Training with bias or output weights: converges to single output.
- Training with only recurrent weights: converges little bit but not meaningful.
- **But:** when disabling weight decay and L2, no more convergence.

Questions

- Only difference: bidirectionality.
  Pros: closer to Bellec.
  Cons: no good reason, no bioplausibility, no online learning.
- Q1: Bidirectional network: is my understanding correct? Switch target sequence too?
- Q2: Should I implement it, or try to maximize performance on unidirectional?
- Q3: Further suggestions on how to proceed, based on current performance?
- Q4: Weights in network?