

Progress Report RC in NLS

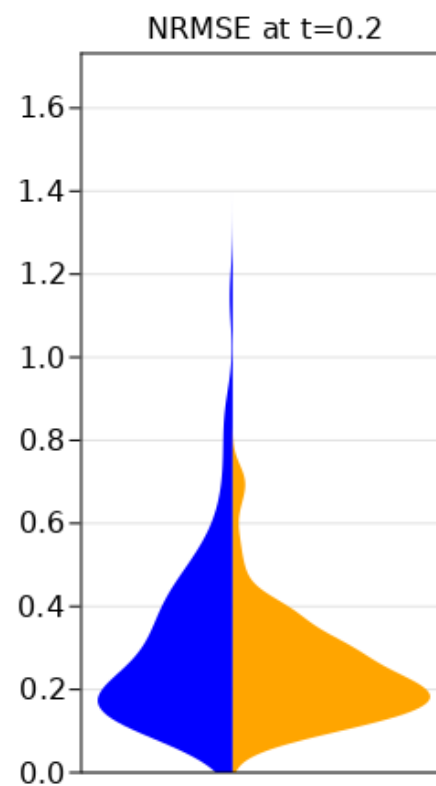
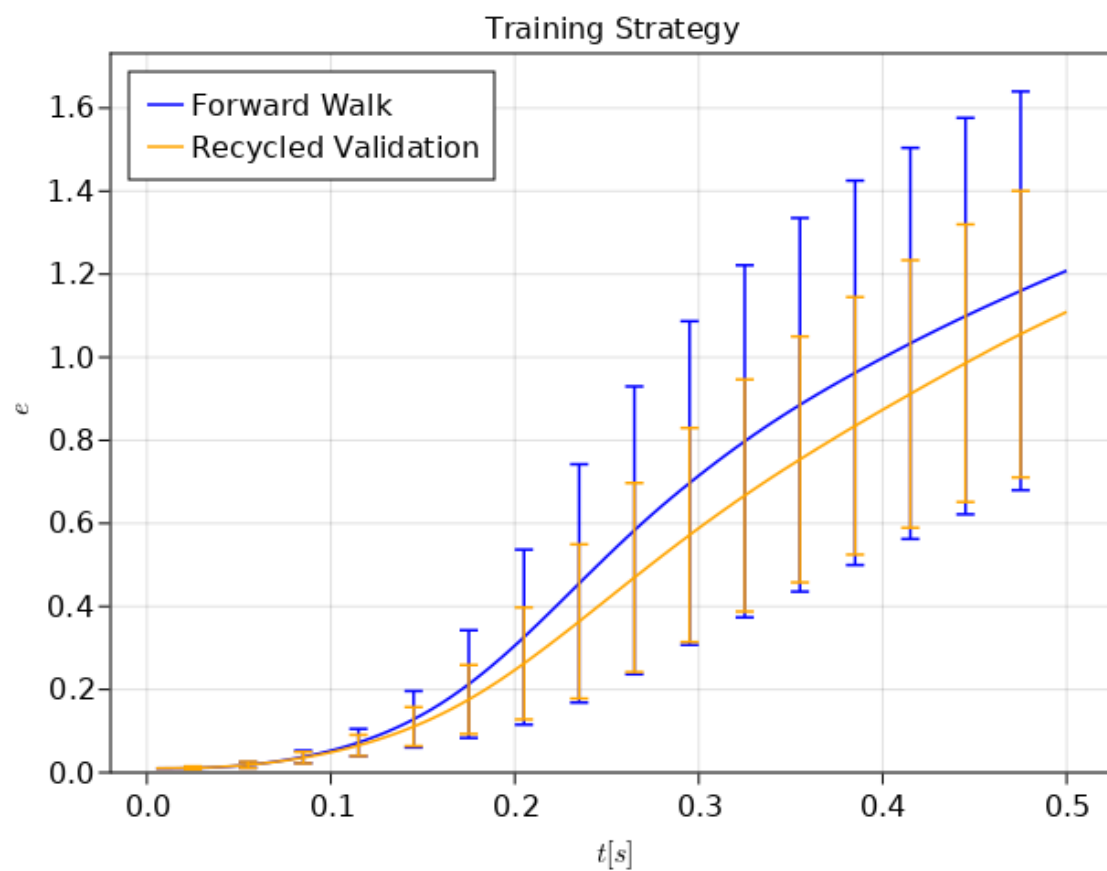
Abrari N H

14 March 2022

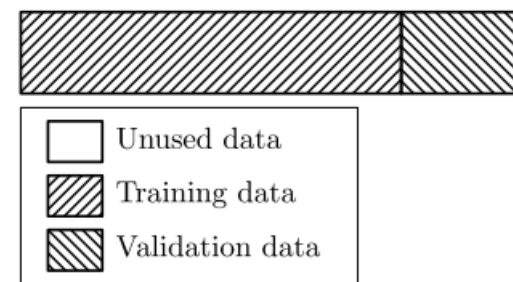
Main Difference from Previous Work

- Using Reservoir with Real Number
- Shorter Training Data: 8000 timesteps, (4s in NLS time)
- Using L_2 norm instead of H^1

Train Strategy

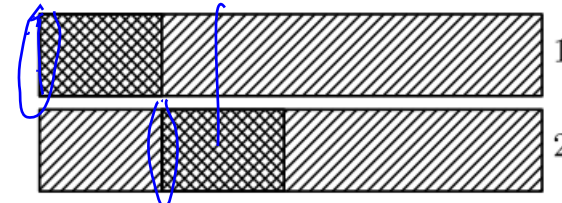


a) Single Shot Validation



$$r_{it} = \tanh(Ar_i + W_{in}u)$$

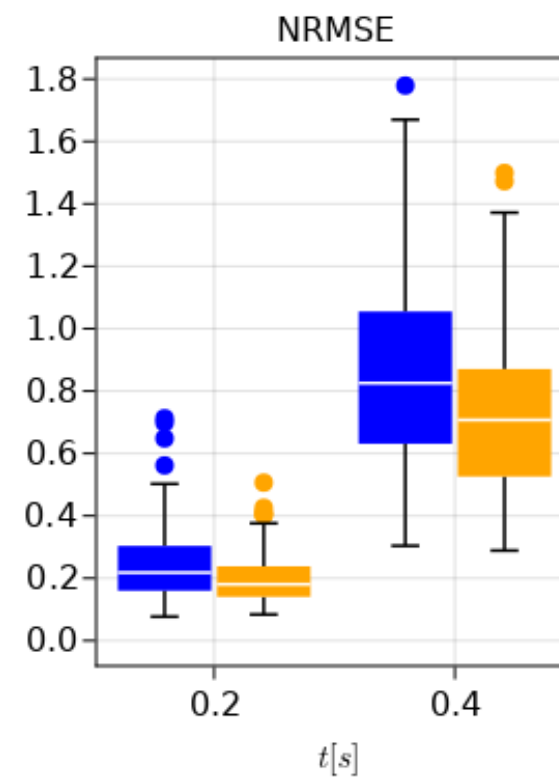
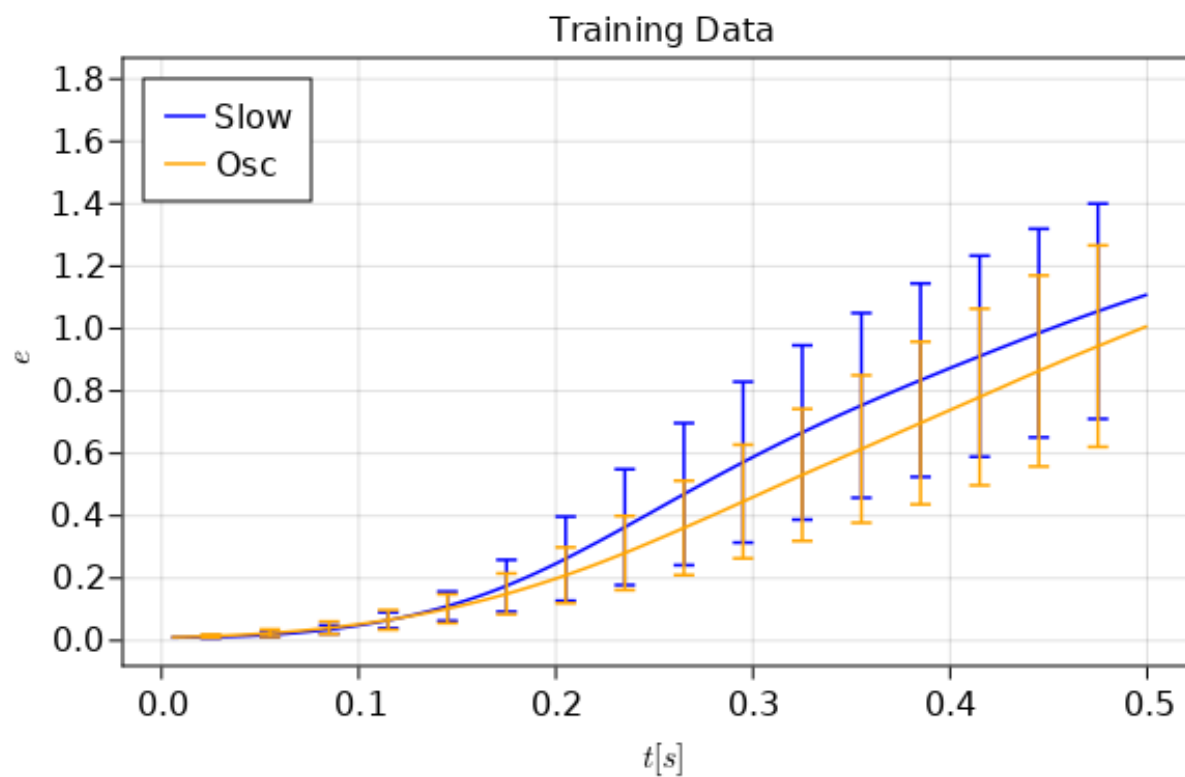
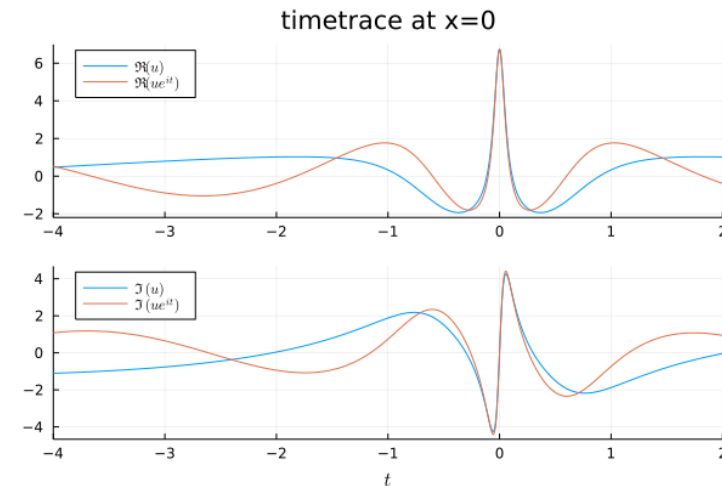
d) Recycle Validation ✓



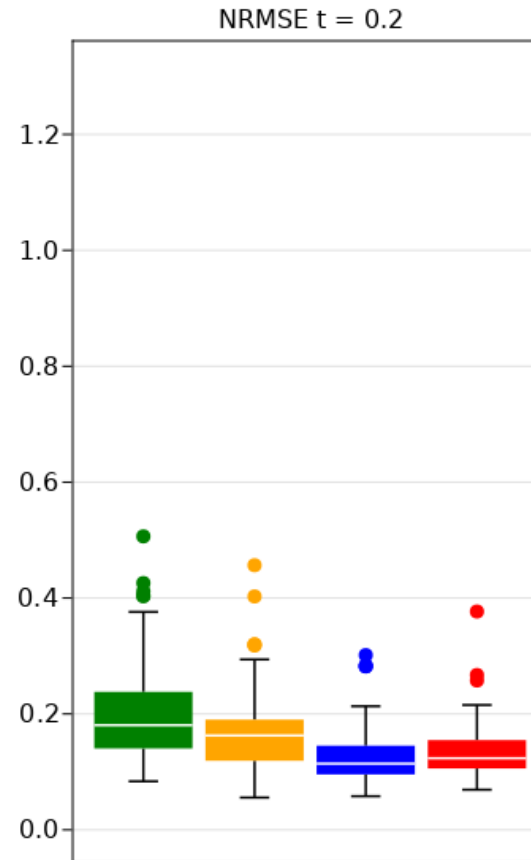
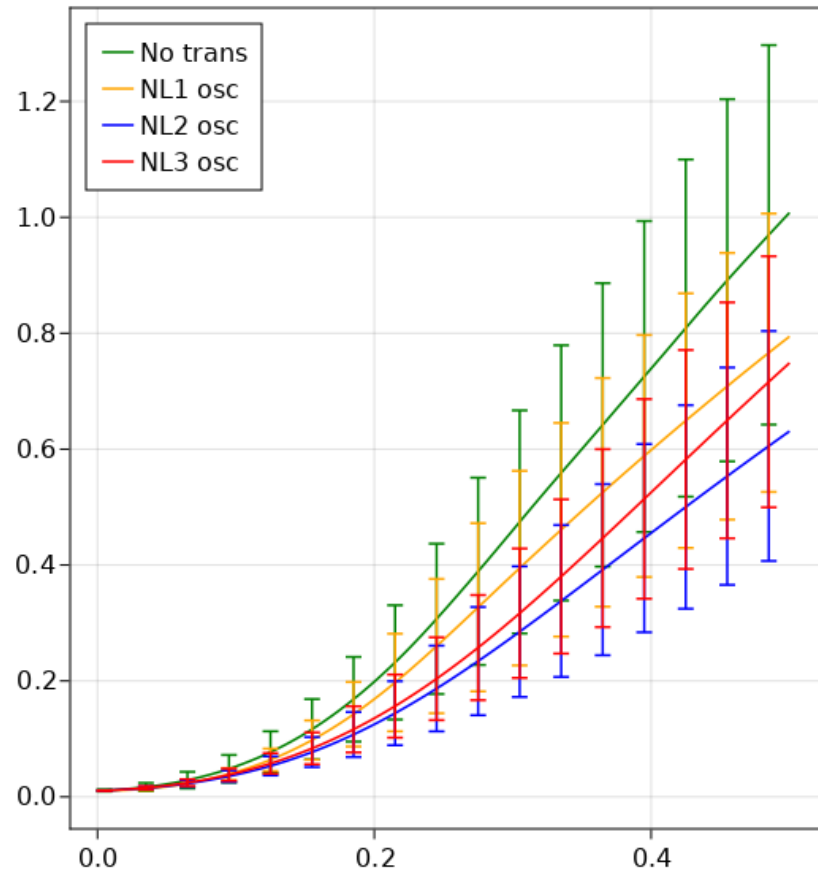
(Racca, 2021)

Different Training Data

$$u = \dots e^{it}$$



Different NLT



$$\text{NL1} \quad \hat{r}_{ij}^{(k)} = \begin{cases} r_{ij}^{(k)} & j \text{ is odd} \\ \left(r_{ij}^{(k)}\right)^2 & j \text{ is even} \end{cases}$$

$$\text{NL2} \quad \hat{r}_{ij}^{(k)} = \begin{cases} r_{ij}^{(k)} & j \text{ is odd} \\ \left|r_{ij}^{(k)}\right| r_{ij}^{(k)} & j \text{ is even} \end{cases}$$

$$\text{NL3} \quad \hat{r}_{ij}^{(k)} = \begin{cases} r_{ij}^{(k)} & j \text{ is odd} \\ \left|r_{ij}^{(k)}\right|^2 r_{ij}^{(k)} & j \text{ is even} \end{cases}$$