<table>
<tr><th rowspan="2">cases</th><th>doc_1</th><th>doc_2</th><th>decision</th><th>id</th></tr>
<tr><td>
<table>
<tr><th>authors</th><td>Vadyala, S.
Betgeri, S.
Betgeri, N.</td></tr>
<tr><th>title</th><td>Physics-informed neural network method for solving one-dimensional advection equation using PyTorch</td></tr>
<tr><th>publication_date</th><td>2022-01-01 00:00:00</td></tr>
<tr><th>source</th><td>SupportedSources.CROSSREF</td></tr>
<tr><th>journal</th><td></td></tr>
<tr><th>volume</th><td></td></tr>
<tr><th>doi</th><td>10.1016/j.array.2021.100110</td></tr>
<tr><th>urls</th><td>https://api.elsevier.com/content/article/PII:S2590005621000515?httpAccept=text/xml
https://api.elsevier.com/content/article/PII:S2590005621000515?httpAccept=text/plain
http://dx.doi.org/10.1016/j.array.2021.100110</td></tr>
<tr><th>id</th><td>id-4224914059725185455</td></tr>
<tr><th>abstract</th><td></td></tr>
<tr><th>versions</th><td></td></tr>
</table>
</td><td>
<table>
<tr><th>authors</th><td>Shashank Reddy Vadyala
Sai Nethra Betgeri</td></tr>
<tr><th>title</th><td>Physics-Informed Neural Network Method for Solving One-Dimensional Advection Equation Using PyTorch</td></tr>
<tr><th>publication_date</th><td>2021-03-15 05:39:17+00:00</td></tr>
<tr><th>source</th><td>SupportedSources.ARXIV</td></tr>
<tr><th>journal</th><td>None</td></tr>
<tr><th>volume</th><td></td></tr>
<tr><th>doi</th><td></td></tr>
<tr><th>urls</th><td>http://arxiv.org/pdf/2103.09662v3
http://arxiv.org/abs/2103.09662v3
http://arxiv.org/pdf/2103.09662v3</td></tr>
<tr><th>id</th><td>id-8091684311333302761</td></tr>
<tr><th>abstract</th><td>Numerical solutions to the equation for advection are determined using different finite-difference approximations and physics-informed neural networks (PINNs) under conditions that allow an analytical solution. Their accuracy is examined by comparing them to the analytical solution. We used a machine learning framework like PyTorch to implement PINNs. PINNs approach allows training neural networks while respecting the PDEs as a strong constraint in the optimization as apposed to making them part of the loss function. In standard small-scale circulation simulations, it is shown that the conventional approach incorporates a pseudo diffusive effect that is almost as large as the effect of the turbulent diffusion model; hence the numerical solution is rendered inconsistent with the PDEs. This oscillation causes inaccuracy and computational uncertainty. Of all the schemes tested, only the PINNs approximation accurately predicted the outcome. We assume that the PINNs approach can transform the physics simulation area by allowing real-time physics simulation and geometry optimization without costly and time-consuming simulations on large supercomputers.</td></tr>
<tr><th>versions</th><td></td></tr>
</table>
</td><td>DUPLICATES</td><td>164</td></tr>
</table>