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To better understand the 2D nanoparticle, ‘graphene’, material researchers need to go through numerous papers to extract metadata like graphene compounds and graphene properties. A Named Entity Recognition (NER) is proposed that uses deep learning methods for extracting graphene-related compounds from research articles in an automated fashion. The deep learning approach is based on a domain-independent method that uses a Bi-directional Long Short-Term Memory (BiLSTM) network with CRF and GRAM-CNN, which will help train the custom dataset. Additionally, a transformer framework called BERT is utilized to pre-train the model on graphene-related texts to perform some downstream tasks like ‘question answering’. The results will be evaluated with domain experts who will label properties and compounds of their interests. The models will be also evaluated using precision, recall, and f-scores for analyzing their accuracy. Since there is a lack of labeled corpus on graphene, the deep neural network approach offsets the need to have manual annotation and feature generation by domain experts.

Keywords: Deep neural network, Graphene, NER, Transformer