**Table 4. List of different types of circRNA-RBP binding prediction models**

|  |  |  |  |
| --- | --- | --- | --- |
| **Model name** | **Core algorithms** | **Data** | **Source code/Web site** |
| CRIP  2019 | CNN+BiLSTM | 37 datasets were obtained from CircInteractome | https://github.com/kavin525zhang/CRIP |
| CircSLNN  2019 | CNN+BiLSTM+CRF | 37 datasets were obtained from CircInteractome | https://github.com/JuYuqi/circSLNN |
| CSCRSites  2019 | CNN | Cancer-specific RBP binding data in CSCD | Unknown |
| MFNN  2020 | Matrix factorization framework based on neural networks | Download circRNA and RBP binding data from CircRic | Unknown |
| PASSION  2020 | 1. IFS and XGBoost feature selection + ANN  2. IFS and XGBoost feature selection + DNN  3. IFS and XGBoost feature selection + ANN+DNN | 37 datasets were obtained from CircInteractome | http://flagship.erc.monash.edu/PASSION/ |
| DeCban  2021 | CNN+Cross-Branch Attention Network | 37 datasets were obtained from CircInteractome | https://github.com/AaronYll/DECban |
| iCircRBP-DHN  2021 | Multi-scale residual network+BiGRU+Attention | 37 datasets were obtained from CircInteractome | https://github.com/houzl3416/iCircRBP-DHN |
| circRB  2021 | CNN+Capsule network | 7 datasets were obtained from CircInteractome | https ://github.com/wzf171/circRB |
| CRPBsites  2021 | BiLSTM+Attention | 4 RBP datasets from ENCORI and CircInteractome database | https://github.com/wzf171/CRPBsites |
| iDeepC  2021 | CNN+Attention | 37 datasets were obtained from CircInteractome | https://github.com/hehew321/iDeepC |
| DMSK  2022 | CNN+BiLSTM+Multi-view TSK-FLS classifier | 37 datasets were obtained from CircInteractome | https://github.com/Rebecca3150/DMSK |
| HCRNet  2022 | Deep temporal convolutional network + Global expectation pooling | 37 datasets were obtained from CircInteractome | https://github.com/yangyn533/HCRNet |
| CRBPDL  2022 | Multi-scale residual network+BiGRU+Self\_Attention | 37 datasets were obtained from CircInteractome | https://github.com/nmt315320/CRBPDL |
| circRIP  2022 | CPM of circRNA/Counts of linear gene + Ratio of CPM between IP and Input/significance with minimum p-value | Three replicate samples of IGF2BP3 RIP-Seq in the WM278 cell line were obtained from the GEO database, 119 and 103 eCLIP datasets of K562 and HepG2 cell lines were downloaded from the ENCODE database. | https://github.com/bioinfolabwhu/circRIP |
| **CircSite**  **2022** | CNN+BiGRU+Transformer | 37 datasets were obtained from CircInteractome | http://www.csbio.sjtu.edu.cn/bioinf/CircSite |
| circ-pSBLA  2022 | CNN+BN+BiLSTM  +Attention | 17 datasets were obtained from CircInteractome | https://github.com/gyj9811/circ-pSBLA. |
| CRWS/ CirRBP  2022 | CNN,CapsNet,LSTM,  Ensemble learning，  Web server | 37 datasets from CircInteractome, ENCORI, and CSCD | http://www.bioinformatics.team |
| JLCRB  2022 | CNN+Joint representation learning module+BiLSTM | 37 datasets were obtained from CircInteractome | https://github.com/Xuezg/JLCRB |
| CircSSNN  2023 | CNN+BN+Seq\_transformer | 37 datasets were obtained from CircInteractome | https://github.com/ cc646201081/CircS SNN |
| circ2CBA  2023 | CNN+BiLSTM+Attention | 8 datasets were obtained from CircInteractome | None |
| CRMSS  2023 | Multi-scale residual block+BiLSTM+Attention | 37 datasets were obtained from CircInteractome | https://github.com/BioinformaticsCSU/CRMSS |
| ASCRB  2023 | CNN + SE-net network BiLSTM+CNN\_BiLSTM | 37 datasets were obtained from CircInteractome | https://github.com/dxqllp/ASCRB |
| Note: due to the limited space in table4, many English abbreviations are used to introduce the core algorithms of these model. We will describe the module composition and functionality in the main paper. | | | |