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| **S.L.** | **Author** | **Year** | **Paper Title** | **Objective** | **Methodology** | **Results:** |
| 1. | Fabian Isensee1, Paul F. Jager1, Peter M. Full1, Philipp Vollmuth2 , and Klaus H.Maier-Hein | 2020 | nnU-Net for Brain Tumor Segmentation | The paper aims to improve brain tumor segmentation in the BraTS 2020 challenge by modifying nnU-Net with BraTS-specific postprocessing, region-based training, and data augmentation. | nnU-Net, Region-based training,  Aggressive data augmentation,  Postprocessing techniques, batch normalization and batch Dice loss | Dice Scores:  WT: 88.95,  TC: 85.06,  ET: 82.03  HD95 values:  WT 8.498,  TC 17.337,  ET 17.805 |
| 2. | Konstantinos Kamnitsas12 , Enzo Ferrante1, Sarah Parisot1, Christian Ledig1, Aditya Nori2, Antonio Criminisi2, Daniel Rueckert1, and Ben Glocker1 | 2017 | DeepMedic for Brain Tumor Segmentation | The objective of this research paper is to enhance DeepMedic 3D CNN with residual connections for brain tumor segmentation and evaluate its performance on BraTS 2015 and 2016 datasets, focusing on TC segmentation. | DeepMedic (3D CNN-based segmentation)  Residual connections, CRF postprocessing, multi-scale processing. | Dice Scores:  WT 91.4,  TC 83.1,  ET 79.4. |
| 3. | Mohammad Havaeia,1, Axel Davyb, David Warde-Farleyc, Antoine Biardc,d, Aaron Courvillec, Yoshua Bengioc, Chris Palc,e, Pierre-Marc Jodoina, Hugo Larochellea, | 2016 | Brain Tumor Segmentation with Deep Neural Networks | The objective of this research paper is to present an automatic brain tumor segmentation approach using CNNs, with a two-pathway design and cascaded framework to enhance accuracy and efficiency. | TwoPathCNN  InputCascadeCNN LocalCascadeCNN MFCascadeCNN | Dice Scores:  WT: 0.88  TC: 0.79  ET: 0.73 |
| 4. | Zachary Schwehr, Sriman Achanta | 2024 | Brain Tumor Segmentation Based on Deep Learning, Attention Mechanisms, and Energy-Based Uncertainty Prediction. | To enhance brain tumor segmentation by proposing a region of interest detection algorithm for MRI data preprocessing. This aims to reduce input size, enable more data augmentations, use deep neural networks, and achieve high segmentation accuracy with uncertainty predictions. | Region of interest detection algorithm. U-Net, CNN autoencoder, Attention, Energy-based model, Test-time augmentations | Mean Dice scores of 84.55, 88.52, and 90.82 on BraTS 2019, 2020, and 2021 datasets respectively. |
| 5. | Xi Guan, Guang Yang, Jianming Ye, Weiji Yang, Xiaomei Xu, Weiwei Jiang, Xiaobo Lai | 2022 | 3D AGSE-VNet: An Automatic Brain Tumor MRI Data Segmentation Framework | Propose an automatic brain tumor segmentation framework (AGSE-VNet) to improve segmentation accuracy by integrating attention mechanisms and squeeze-excite modules. | AGSE-VNet :  Squeeze and Excitation (SE) module, Attention Guide Filter (AG) | Accuracy : Dice Score:  WT: 0.68  TC: 0.85  ET: 0.70 |
| 6. | Wentao Wu, Daning Li, Jiaoyang Du, Xiangyu Gao, Wen Gu, Fanfan Zhao, Xiaojie Feng, Hong Yan | 2020 | An Intelligent Diagnosis Method of Brain MRI Tumor Segmentation Using Deep Convolutional Neural Network and SVM Algorithm | Improve segmentation performance by integrating DCNN and SVM for more accurate classification of glioma regions in MRI scans. | Deep Convolutional Neural Network (DCNN)  Support Vector Machine (SVM) |  |
| 7. | Hasnain Ali Shah, Faisal Saeed, Sangseok Yun, Jun-Hyun Park, Anand Paul, Jae-Mo Kang | 2022 | A Robust Approach for Brain Tumor Detection in Magnetic Resonance Images Using Finetuned EfficientNet | Fine-tune EfficientNet to improve brain tumor classification accuracy in MRI scans. | EfficientNet-B0,  Data augmentation and transfer learning | Final Accuracy:  98.87% |
| 8. | Shubhangi Nema, Akshay Dudhane, Subrahmanyam Murala, Srivatsava Naidub | 2019 | RescueNet - An Unpaired GAN for Brain Tumor Segmentation | This paper proposes *RescueNet*, a deep learning model using an unpaired GAN for brain tumor segmentation in MRI scans, enhancing performance without paired data. | RescueNet  GAN-based training  RescueWNet (WT), RescueCNet (TC), and RescueENet (ET) | Accuracy:  Dice Score:  WT: 94.63%  TC: 85.6% ET:93.54% |
| 9. | Amjad Rehman Khan, Siraj Khan, Majid Harouni, Rashid Abbasi, Sajid Iqbal, Zahid Mehmood | 2021 | Brain Tumor Segmentation Using K-Means Clustering & Deep Learning | This study presents a hybrid method combining K-means clustering for segmentation and fine-tuned VGG19 CNN for classification, with synthetic data augmentation to improve accuracy. | K-Means Clustering  VGG19 CNN model  Synthetic Data Augmentation  transfer learning | Classification accuracy:  Before DA:  90.03%  After DA: 94.06% |
| 10. | Huan Minh Luu, Sung-Hong Park | 2021 | Extending nn-UNet for Brain Tumor Segmentation | The paper modifies the nn-UNet framework for improved brain tumor segmentation by incorporating group normalization, larger networks, and axial attention in the decoder. | nn-UNet, 3D U-Net framework | Dice Scores: ET: 84.51, TC: 87.81, WT: 92.75  HD95:  ET - 22.41,  TC - 9.20,  WT - 3.42 |
| 11. | Abhishta Bhandari, Jarrad Koppen, Marc Agzarian | 2020 | Convolutional Neural Networks for Brain Tumor Segmentation | This study explores CNNs for glioblastoma segmentation, showing improved consistency over manual methods and discussing future applications in radiomics. | CNNs, Feature extraction via deep learning, Data augmentation, Watershed algorithm | Dice Scores:  WT: 0.89  TC: 0.76  ET: 0.81 |
| 12. | J. Walsh, A. Othmani, M. Jain | 2022 | Using U-Net for Efficient Brain Tumor Segmentation | Proposes an optimized, lightweight U-Net architecture for segmenting brain tumors from MRI scans with minimal computational resources. | U-Net,  2D image conversion,  Lightweight implementation | Pixel Accuracy: 99%  Mean IoU: 89% |
| 13. | Shengcong Chen, Changxing Ding, Minfeng Liu | 2018 | Dual-Force Convolutional Neural Networks for Accurate Brain Tumor Segmentation | The paper proposes a dual-force training strategy to improve feature learning in CNNs for brain tumor segmentation, extending DeepMedic to MLDeepMedic and introducing MLP-based post-processing for better accuracy. | Multi-Level DeepMedic CNN,  U-Net,  Hierarchical feature learning, Multi-Layer Perceptron (MLP) | Dice Scores:  BraTS 2017:  WT: 89.3  TC :73.88  ET: 73.46    BraTS 2015:  WT: 85  TC: 70  ET: 63 |
| 14. | Khushboo Munir Fabrizio Frezza,  AntonelloRizzi | 2022 | Deep Learning Hybrid Techniques for Brain Tumor Segmentation | This paper proposes hybrid deep learning techniques using modified U-Net architectures with inception modules for brain tumor segmentation, aiming to improve accuracy, sensitivity, and specificity in detecting gliomas. | Recurrent-Inception U-Net (MI-Unet)  Depth-wise Separable MI-Unet Hybrid Recurrent-Inception U-Net Depth-wise Separable Hybrid Recurrent-Inception U-Net | Dice Coefficient:87.75%  Sensitivity:90.26%  Specificity:99.42% |
| 15. | Mehrdad Noori, Ali Bahri, Karim Mohammadi | 2020 | Attention-Guided Version of 2D UNet for Automatic Brain Tumor Segmentation | This paper introduces an attention-guided 2D U-Net with multi-view fusion for brain tumor segmentation, improving feature extraction and reducing model confusion. | Modified 2D U-Net with: Attention Mechanism (SE Blocks), Multi-View Fusion | Dice Scores:  ET: 81.3%  WT: 89.5%  TC: 82.3% |
| 16. | Chandrakant M. Umarani, S.G. Gollagi, Shridhar Allagi, Kuldeep Sambrekar, Sanjay B. Ankali | 2024 | Advancements in Deep Learning Techniques for Brain Tumor Segmentation: A Survey | The paper proposes a deep learning framework integrating U-Net with self-attention mechanisms to improve accuracy, precision, and sensitivity in brain tumor segmentation. | U-Net++DSM (Deep Supervision Mechanism),  TransU2-Net,  F2-Net,  DenseTrans,  Caps-VGGNet Hybrid Model | U-Net++DSM  Sensitivity: 98.59%  Specificity: 98.64%  Accuracy: 98.64%  Dice Score: 98.02% |
| 17. | Zhihua Liu, Lei Tong, Long Chen, Zheheng Jiang, Feixiang Zhou, Qianni Zhang, Xiangrong Zhang, Yaochu Jin, Huiyu Zhou | 2022 | Deep Learning-Based Brain Tumor Segmentation: A Survey | The paper reviews deep learning-based brain tumor segmentation techniques, analyzing over 150 studies to highlight trends, challenges, and future directions. | DenseTrans, TransU2-Net | DenseTrans:  Dice Score of 93.2%  TransU2-Net:  Dice Score of 88.17% |
| 18. | Almetwally M. Mostafa, MohammedZakariah and EmanAbdullah Aldakheel, | 2023 | Brain Tumor Segmentation Using Deep Learning on MRI Images | The study develops an automated deep learning system using a CNN with U-Net sampling for classifying and segmenting brain tumors, including gliomas and pituitary tumors. | CNN, Deep CNN with U-Net, FCN | Overall validation accuracy: 98%  Dice Coefficient: 0.9012  Mean IoU: 0.9123  Precision: 0.9923  Sensitivity: 0.9678  Specificity: 0.9988 |
| 19. | R.Karthika,  Dr.A.Gopi Kannan | 2023 | Brain Tumor Segmentation with Deep Learning | The study presents ZNet, a deep neural network that enhances brain tumor segmentation using skip connections, data augmentation, and adversarial networks. | SVM, Naïve Bayes Classifier, KNN, ZNet, CNN | ZNet:  Accuracy: 87.54%  F1-Score:  16.58%. |
| 20. | J. Harshini, K. Gayatri | 2021 | Brain Tumor Detection Using Deep Learning Framework | The study aims to improve brain tumor classification accuracy and efficiency using a two-pathway CNN architecture integrating local and global features. | Support Vector Machines (SVM)  Random Forests  Multi-Layer Perceptron (MLP) | Accuracy: 98.64%  Sensitivity: 98.59%  Specificity: 98.64% |