Deep Learning for Detection of Drug Using Brain PET Images [†]

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Abstract: Consumption of drugs has become the most serious or challenging problem that the fast-growing and emerging society faces. More youngsters are addicted to these drugs, which drastically increases the crime rate; in many cases, people committing mistakes are subjected to any one form of drug intake. Positron emission tomography (PET) is a process of scanning the brain and capturing the picture of brain activity by radioactive tracers absorbed by the bloodstream. PET scans are highly useful as it sometimes detects the disease before it shows up in any other form of image testing like CT or MRI scans. PET is used to emit radioisotopes that produce cyclotron, the radioactive tracers are injected into the brain to detect the radioactive material in all regions of the brain and highlight the areas of increased blood flow, and it records it as an image. In general, when a patient undergoes a PET scan, the doctor can diagnose the exact size, shape, and functioning of the brain; also, the doctor can identify whether the patient is addicted to any form of drug, cocaine, or alcohol consumption and to find the severity of their levels. The outcome of a PET scan is a multicolored image ranging from dark blue to red, and the active parts of the brain are marked yellow and green. The dark areas of the scan indicate the impaired area; the doctors go through the scan and comes with the possible outcomes. In the recent past, deep learning algorithms find application in the image classification application. In this present work, an attempt is taken to predict drug consumption status using the deep learning technique.

Keywords: deep learning; drug detection; positron emission tomography.

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Conflicts of Interest

The authors declare no conflict of interest.