Deep brain stimulation (DBS) has therapeutic benefits for neurological disorders, such as Parkinson’s disease, tremors, chronic pain, and dystonia. Existing DBS solutions utilize four-channel electrodes that only allow spherical charge distributions. This lack of targeting capability results in placement errors, with three to five insertions typically required for correct placement.

A new electrode with enhanced circuitry enhances targeting and improves stimulation by selecting structure deep within the brain for therapeutic stimulation. The electrode uses a silicon backbone and seven wires for full control over an unlimited number of electrode contacts. The stimulation parameters can be controlled based on the neuroanatomical target by switching between contacts. This facilitates effective DBS on the first insertion of the electrode into the brain. The high number of small contacts on the surface also allows tight control over the amount of tissue being excited.

- Enables better penetration of brain tissue and enhanced targeting for structures deep within the brain.
- Activates neurons with hundred-micron spatial resolution.
- Accommodates millimeter scale errors in surgical targeting through voltage shaping.

**REFERENCES**


**INVENTOR PROFILE**

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