

# Resource Summary Report

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## Institute for Neuroinformatics: Cortex 3D

RRID:SCR\_008704

Type: Tool

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### Proper Citation

Institute for Neuroinformatics: Cortex 3D (RRID:SCR\_008704)

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### Resource Information

**URL:** <http://www.ini.uzh.ch/~amw/seco/cx3d/>

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**Description:** INI has developed a novel simulation tool, CX3D, for modeling the development of large realistic neural networks such as the neocortex, in a physical 3D space. The development of neural tissue is a complex organizing process, in which it is difficult to grasp how the various localized interactions between dividing cells leads relentlessly to global network organization. Simulation is a useful tool for exploring such complex processes because it permits rigorous analysis of observed global behavior in terms of the mechanistic axioms declared in the simulated model. In CX3D, as in biology, neurons arise by the replication and migration of precursors, which mature into cells able to extend axons and dendrites. Individual neurons are discretized into spherical soma and cylindrical neurite elements that have appropriate mechanical properties. The growth functions of each neuron are encapsulated in set of pre-defined modules that are automatically distributed across its segments during growth. The extracellular space is also discretized, and allows for the diffusion of extracellular signaling molecules, as well as the physical interactions of the many developing neurons. CX3D is a powerful tool for understanding neural development. Sponsors: CX3D has been developed with the support of the SECO EU Project (EU grant 216593). Keywords: Neuinformatics, Cortex, 3D, 3 Dimensional, Neocortex, Physics, Neural, Tissue, Simulation, Neuron, Structure, Biology, Axon, Dendrite, Soma, Neurite, Development,

**Synonyms:** INI CX3D

**Resource Type:** simulation software, software application, software resource

**Resource Name:** Institute for Neuroinformatics: Cortex 3D

**Resource ID:** SCR\_008704

**Alternate IDs:** nif-0000-37830

**Record Creation Time:** 20220129T080248+0000

**Record Last Update:** 20260829T182322+0000

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## Ratings and Alerts

No rating or validation information has been found for Institute for Neuroinformatics: Cortex 3D.

No alerts have been found for Institute for Neuroinformatics: Cortex 3D.

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## Data and Source Information

**Source:** [SciCrunch Registry](#)

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## Usage and Citation Metrics

We found 2 mentions in open access literature.

**Listed below are recent publications.** The full list is available at [dkNET](#) .

Spühler IA, et al. (2013) Decoding the dopamine signal in macaque prefrontal cortex: a simulation study using the Cx3Dp simulator. PloS one, 8(8), e71615.

A?imovi? J, et al. (2011) Modeling of Neuronal Growth In Vitro: Comparison of Simulation Tools NETMORPH and CX3D. EURASIP journal on bioinformatics & systems biology, 2011(1), 616382.