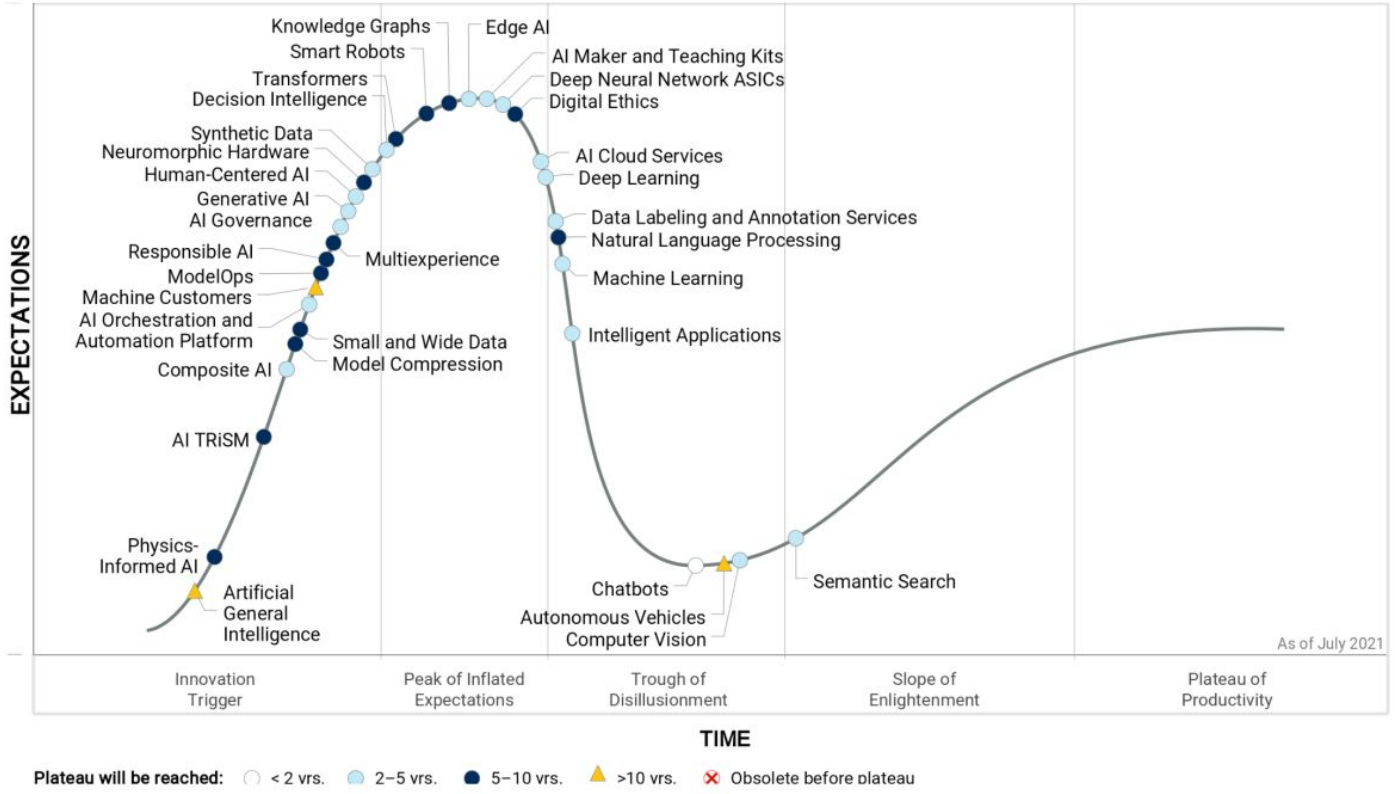
NeuroML2022

Lecture 0. Course intro

AI in medical images. AI in neurology.

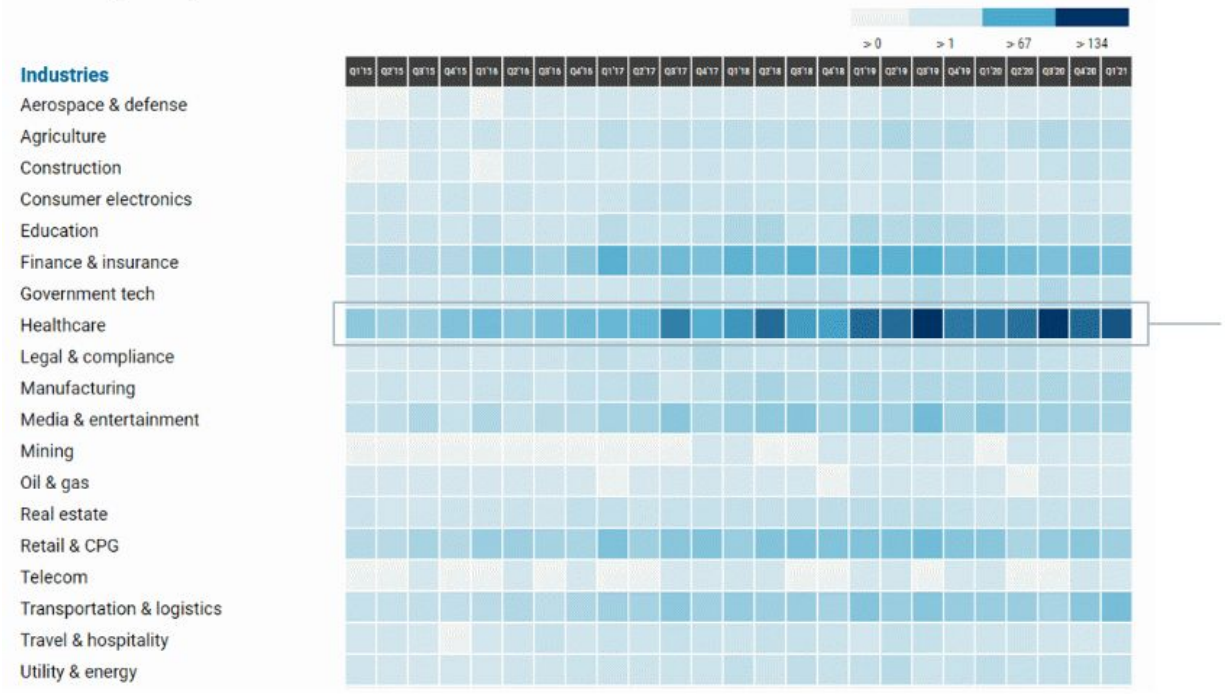


Gartner Identifies Four Trends Driving Near-Term Artificial Intelligence Innovation, September 7, 2021,
https://www.gartner.com/en/newsroom/press-releases/2021-09-07-gartner-identifies-four-trends-driving-near-term-artificial-intelligence-innovation

From the materials of Ekaterina Kondratieva's presentation

AI in medical images. AI in neuro.

Healthcare AI has attracted the most investments across all AI sectors in recent years



115 transactions were concluded in Q1 2021
&
record funding of >$2.5 billion

CBINSIGHTS. The AI Deals Tracker. https://www.cbinsights.com/research/artificial-intelligence-deals-tracker-heatmap/

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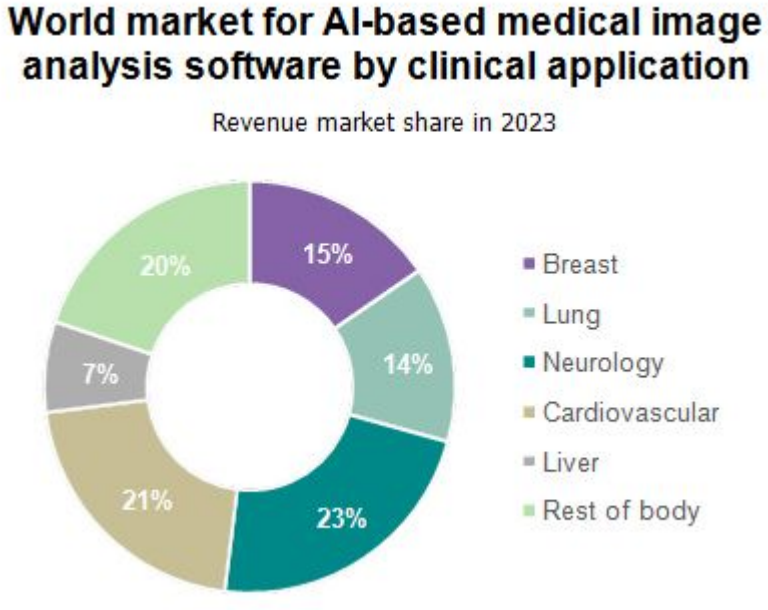

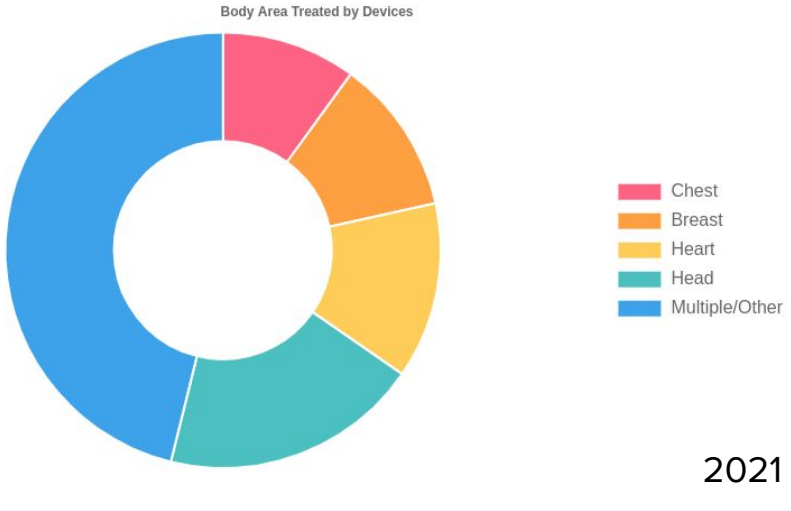

Source: Signify Research 2018

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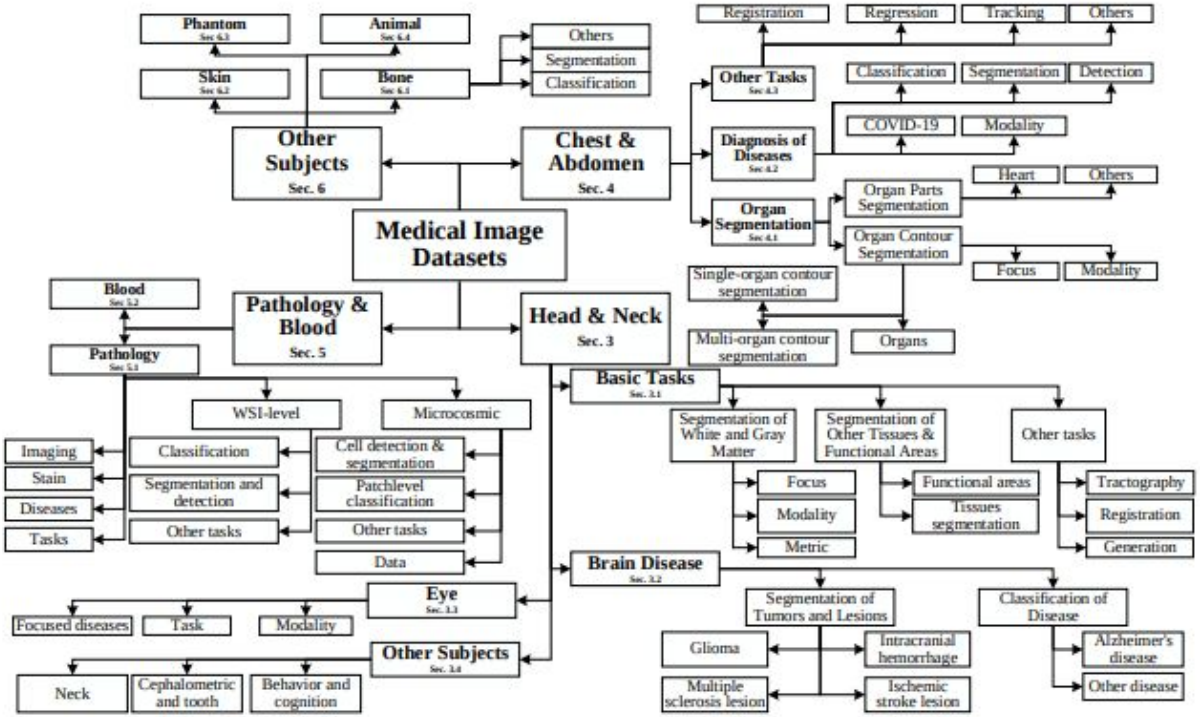

https://arxiv.org/pdf/2106.12864.pdf

From the materials of Ekaterina Kondratieva's presentation

Datasets used (please get a personal account and complete data use agreement):

- Human Connectome Project https://db.humanconnectome.org/data/projects/HCP_1200
- UCLA Consortium for Neuropsychiatric Phenomics LA5c Study https://openneuro.org/datasets/ds000030/versions/1.0.0
- Autism Brain Imaging Data Exchange http://fcon_1000.projects.nitrc.org/indi/abide/
- EEG Motor Movement/Imagery Dataset https://www.physionet.org/content/eegmmidb/1.0.0/
- ADNI Alzheimer Disease Neuoroimaging Initiative https://ida.loni.usc.edu/services/NewUser.jsp

Software used (please get a personal account and complete usage agreement):

- FreeSurfer https://surfer.nmr.mgh.harvard.edu/
- FmriPrep https://fmriprep.org/en/stable/
- Docker https://www.docker.com/
- MNE python library https://mne.tools/stable/index.html

MRI Deep Learning Tools

https://github.com/kondratevakate/mri-deep-learning-tools

    - **nibabel**
    - **Nipy**
- Machine Learning:
    - **Nilearn**
- Deep Learning:
    - **Monai**
    - TorchIO
    - PyTorch Lightning
    - Weights&Bias