Aktuelle områder

1) Elektronikk/robotikk (gjerne marin-relatert)
2) Romfysikk
3) Maskinlæring, deep learning, og avansert statistikk

a) Maskinlæring: Mer info om aktuelle områder innenfor maskinlæring under (engelsk)
i) Cyber-defense
ii) Robotic swarms
iii) DSN scheduling
iv) Voice recognition and speech transcription/data extraction
v) Data analytics for spacecraft health

b) Avansert statistikk
(i) Spatial and Spatio-temporal statistical methods and applications, especially for remote sensing
(ii) Uncertainty Quantification

4) Materialvitenskap (gjerne innen termoelektriske materialer)
a) Li-ion batterier
i) Safety (with testing, pack level designs, cell selection) to support their extensive electrification of boats and autos.

5) Geofag/GIS/fjernmåling/planetary science

6) CubeSat Technology

Maskinlæring og Deep Learning, mer informasjon:

Cyber-defense

- By applying machine learning techniques to network traffic logs and to system logs, the software learns normal system behavior and then is used to detect anomalous and potentially malicious network intrusions.

- **Robotic swarms**
  In collaboration with Caltech, JPL is working on applying AI technologies to swarms of robotic spacecraft that are designed to work together and need to stay in a particular formation while, for example, orbiting Earth.

- **DSN scheduling**
  § With more and more spacecraft demanding time of use from the Deep Space Network (DSN), scheduling when missions can have access to a ground based antenna is becoming more and more difficult. This is only going to get more challenging as the number of cubesats increase. The goal is to apply machine learning algorithms to maximize DSN utilization while at the same time prioritizing based upon need and occasional off-nominal situations such as a spacecraft emergency.

- **Voice recognition and speech transcription/data extraction**
  Voice recognition technology has been around for some time. The difficult part voice of recognition is determining who is talking in a very noisy environment, e.g. a cocktail party. An even more difficult part is extracting the spoken word, understanding the context and then using the extracted words appropriately, such as recording spoken data as it is intended to be stored. For example, a paramedic taking a blood pressure of a patient and through voice having it correctly recorded into a database as numbers, not text.

- **Data analytics for spacecraft health**
  Deep space missions produce a lot of telemetric data. Included in this data is engineering data intended to track the health of the spacecraft. Being able to quickly asses why off-nominal behavior is occurring and the possible causes is typically done after the fact. Machine learning technologies are being developed to learn nominal spacecraft behavior based on historic telemetry and then monitoring in near real-time the telemetry of the spacecraft. As part of this, visualization tools are being developed to help mission operators quickly assess the health of a spacecraft and react quickly to anomalous behavior to enable rapid triage, diagnosis and remediation when something goes wrong.