

Bachelor and Master theses at GIS



Fields of application

Earth tides (1)
 Earth deformation modelling (10)
 Seismology (2, 10, 15)
 Sea level (10), water body height (3, 4, 24)
 Bathymetry (4, 23), Hydrology (4, 20, 27, 28, 30)
 Climate (14, 19, 21)
 Marine geodesy (8)

Methods

ML/Neural network (11, 12)
 Physical geodesy (16, 17, 22, 29, 31, 33)
 Data analysis (1, 5, 6, 7, 9, 13, 14, 15)
 Estimation, Bayesian statistics (5, 6, 7, 20, 30)
 Orbital/celestial mechanics (16, 18, 31, 32, 33)

Observation techniques

GNSS (8, 9, 10)
 Satellite gravimetry (7, 15, 17, 18, 19, 20, 21)
 Altimetry (3, 4, 5, 6, 11, 12, 13, 19, 22, 23, 24, 26, 27, 30)
 remote sensing (23)
 Ground sensors (1, 2, 8, 28, 29)

Other: 25

DE: Unten finden Sie die Liste der Themen, die derzeit von GIS angeboten werden. Um die Suche zu erleichtern, können Sie sich die verschiedenen Stichworte in den oben stehenden Kästchen ansehen. Die Zahlen in Klammern bezeichnen die entsprechenden Themen. Wenn Sie an einem oder mehreren Themen interessiert sind, wenden Sie sich bitte an den Supervisor für weitere Informationen. Die E-Mail des Supervisors finden Sie auf der GIS-Website: <https://www.gis.uni-stuttgart.de/team/>

EN: Below is the list of topics currently offered by GIS. To ease the search, you can have a look at the different keywords in the boxes hereinabove. The numbers in brackets indicate the corresponding topics. If you are interested in one or more topics, feel free to contact the Supervisor for more details. The supervisor's email can be found on the GIS website: <https://www.gis.uni-stuttgart.de/team/>

	title	Keywords	Level	Supervisor	Co-supervisors
1	Evaluation of new tiltmeter at BFO: Frequency calibration, self-noise.	instrumentation, data analysis, Earth tides	bachelor	Rudolf Widmer-Schnidrig	
2	Experiments on Earth to simulate the response of the InSight seismometer to Phobos eclipses on Mars.	instrumentation, planetary seismology	bachelor, master	Rudolf Widmer-Schnidrig	
3	Water surface and ice height-retrieval algorithms for ICESat-2 laser altimeter.	laser altimeter, water level, ice sheet	bachelor, master	Bo Wang	
4	Laser altimetry applications: water level variation, ice thickness, coastal bathymetry.	laser altimeter, hydrology, bathymetry	bachelor, master	Bo Wang	
5	Defining a retracking manifold within a radargramm stack to improve satellite altimetric water level over coastal seas and inland water bodies.	data analysis, altimetry, Bayesian statistics	master	Mohammad Tourian	Omid Elmi

6	Obtaining a reliable uncertainty for altimetric water level over narrow inland water bodies.	data analysis, altimetry, statistical inference	master	Mohammad Tourian	Sajedah Behnia
7	Filling the GRACE gap using high-low satellite to satellite tracking within a Bayesian framework.	Satellite gravimetry, data analysis, Bayesian statistics	master	Mohammad Tourian	Karim Douch
8	Optimizing survey strategies for sea-floor geodetic measurements.	GNSS, acoustic ranging, marine geodesy, oceanographic noise, hazard mitigation	master	James Foster	
9	Detection thresholds for ionospheric detection of tsunamis from ship-based GNSS.	GNSS, TEC, ionosphere, tsunami, hazard mitigation, data analysis	bachelor, master	James Foster	
10	Impact of viscoelastic relaxation from major earthquakes on Hawaii subsidence rates.	GNSS, sea level, earthquakes, deformation modeling, rheology, hazard mitigation	master	James Foster	
11	Retracking of altimetric waveform stacks by neural networks.	neural networks, satellite altimetry	master	Dennis Mattes	Nico Sneeuw
12	Outlier detection in satellite altimetry using machine learning.	machine learning, satellite altimetry	master	Dennis Mattes	Peyman Saemian
13	Off-nadir effect in radar altimetry: is it possible to improve the accuracy of altimetric time series by characterizing the off-nadir patterns?	altimetry, data analysis	master	Sajedah Behnia	Mohammad Tourian
14	Searching for causalities in geodetic and climatic time series.	empirical dynamics modelling, time series analysis	master	Karim Douch	Peyman Saemian
15	Identification of earthquake co-seismic signature in space altimetry and GRACE data.	seismology, space gravimetry, signal processing	master	Karim Douch	Clara Bützler
16	Future gravity mission design, high-low SST constellations.	gravity mapping, orbit design	master	Nico Sneeuw	Karim Douch Clara Bützler
17	Quality control of GRACE-FO gravity field models by their phase spectra.	GRACE-FO, gravity field models	bachelor	Nico Sneeuw	
18	Line-of-sight gravity residuals from GRACE-FO laser tracking.	GRACE-FO, orbits, gravity	master	Nico Sneeuw	
19	Climate change and permafrost: multi-mission mixed-observable satellite data.	gravity, remote sensing, altimetry	master	Nico Sneeuw	Mohammad Tourian
20	Downscaling satellite gravity for use in hydrological models.	GRACE-FO, hydrology, downscaling	master	Nico Sneeuw	Mohammad Tourian
21	Satellite-based drought monitoring.	GRACE-FO gravity, soil moisture	bachelor	Nico Sneeuw	Peyman Saemian
22	Salt flats around the world: possibility for validation of satellite altimetry.	satellite altimetry, SWOT, geoid	bachelor, master	Nico Sneeuw	Sajedah Behnia Bo Wang
23	Lake bathymetry: combining satellite altimetry, satellite imagery and digital terrain models.	satellite altimetry, remote sensing, DTM	master	Nico Sneeuw	Omid Elmi
24	Reservoir monitoring by satellite altimetry in politically critical regions.	reservoirs, satellite altimetry	bachelor	Nico Sneeuw	Sajedah Behnia Bo Wang
25	Spherical projector for teaching purposes.	hardware, visualization	bachelor, master	Nico Sneeuw	Karim Douch Ron Schlesinger
26	The SWOT simulator.	SWOT, swath altimetry	master	Nico Sneeuw	Mohammad Tourian
27	River discharge from wide swath altimetry (SWOT satellite mission).	SWOT, swath altimetry	master	Nico Sneeuw	Mohammad Tourian
28	Hydrology effects in superconducting gravimetry time series: signal or noise?	gravimetry, hydrology, signal analysis	master	Nico Sneeuw	Clara Bützler Rudolf Widmer-Schmidrig
29	Measurements of vertical gravity gradient around Stuttgart.	gravimetry, gradiometry, physical geodesy	bachelor	Nico Sneeuw	Ron Schlesinger
30	River dynamics and satellite altimetry: Kalman filtering vs. river routing schemes.	estimation theory, hydrology	bachelor, master	Nico Sneeuw	Mohammad Tourian

31	Lunar halo orbits as space geodetic stations?	orbits, space geodesy	master	Nico Sneeuw	
32	Space junk: analysing the space debris database, orbit classification, collision avoidance and prediction of orbit evolution.	orbits, satellite geodesy	bachelor, master	Nico Sneeuw	
33	Orbits around asteroids and comets: polyhedron modelling of gravity field and orbit propagation in 3-body problem under solar pressure.	orbits, gravity field	master	Nico Sneeuw	