



INFOMAT

AUGUST 2021



STUDIESTART 2021

NÆRMER VI OSS EN MER NORMAL HVERDAG?

INFOMAT kommer ut med 11 nummer i året og gis ut av Norsk Matematisk Forening. Deadline for neste utgave er alltid den 15. i neste måned. Stoff til INFOMAT sendes til

arnebs at math.uio.no

Foreningen har hjemmeside <http://www.matematikkforeningen.no/>
Ansvarlig redaktør er Arne B. Sletsjøe, Universitetet i Oslo

Matematisk kalender

På grunn av den pågående pandemien kan flere av arrangementene bli utsatt eller avlyst. Følg med på web-sidene.

2021

September:

27.-28. Mathematics without Borders, IMU 100 år, Strasbourg

2022

Juni:

12.-19. juni. Seminar Sophus Lie, Nordfjordeid <<https://www.mathematik.uni-marburg.de/agricola/SSL2021/>>

SEMINAR SOPHUS LIE, Nordfjordeid, 12.-19. juni 2022



Seminaret er utsatt til 12.- 19. juni 2022.

Nye doktorgrader

M.Sc. Maxime Conjard ved NTNU forsvarte 10. juni 2021 sin avhandling *The Selection Kalman Model - Data assimilation for spatiotemporal variables with multimodal spatial histograms.* for graden PhD.

Veiledere har vært Professor Henning Omre, NTNU.

Sammendrag:

My thesis considers assimilation of spatio-temporal data. The goal was to develop a methodology that could model multimodality in the both the prior and posterior distributions. We propose the

use of the selection Kalman model for both linear and non-linear forward and likelihood models. The first paper considers linear models and the proposed methodology is compared to the Kalman Filter. In the second and third papers, the methodology is extended to non-linear forward and likelihood models and tested against the ensemble Kalman Filter on synthetic case studies. The report, which constitutes the last part of the thesis, tests the methodology on real data and compares it to existing methods that are commonly used in the field of data assimilation.

M.Sc. Benjamin Kwanen Tapley ved NTNU forsvarte 14. juni 2021 sin avhandling *Structure - preserving numerical methods with application to problems in particle dynamics* for graden PhD.

Veiledere har vært Professor Elena Celledoni (hovedveileder), Professor Brynjulf Owren og Professor Helge Andersson (medveiledere), alle NTNU.

Sammendrag:

My thesis is divided into two topics. The first concerns the application of geometric numerical integration methods to the equations that govern the dynamics of particles in viscous flows. Here, we propose numerical methods that preserve geometric features of the exact solution, such as the contractivity of phase space volume and the centrifuge-effect, which is one of the mechanisms that describe the clustering of particles. In addition, we develop a new model and numerical method for describing the dynamics of slender particles.

The second topic is concerned with a discrete analogue of Darboux polynomials, which is a method used to find preserved quantities of ODEs. Here, we show that using discrete Darboux polynomials, one can derive preserved measures and integrals of rational maps. We also study the preservation of Darboux polynomials under Runge-Kutta methods and show that all such methods preserve affine Darboux polynomials of any ODE.

Siv.ing Ingeborg Gullikstad Hem ved NTNU forsvarte 25. juni 2021 sin avhandling *Robustifying Bayesian Hierarchical Models Using Intuitive Prior Elicitation* for graden PhD.

Veiledere har vært Ass. Professor Geir-Arne Fuglstad (hovedveileder) samt Professor Andrea Riebler og Professor Håkon Tjelmeland, alle NTNU.

Sammendrag:

This thesis presents the new prior framework hierarchical decomposition (HD) priors. The HD prior framework makes it possible to specify joint priors for variance parameters in Bayesian hierarchical models that are intuitive, easily communicated, and robust in the sense that it leads to stable inference and avoids estimating spurious random effects. It offers a simple way of including prior intuition and knowledge in the prior, and is a tool for easy communication of the prior. With this framework we can simplify the process of eliciting prior knowledge and choosing a good prior, reflecting our prior beliefs on the scale of the prior knowledge.

Nyheter

SØSTRENE DAHLS PRIS TIL JOHN CHRISTIAN OTTEM

Professor John Christian Ottem ved UiO har mottatt Søstre Dals forskningspris for sine arbeider i teoretisk matematikk.

Om prisen: Dette er en litt spesiell pris ved UiO som utdeles når man finner en verdig mottaker enten i teoretisk matematikk, rasjonalistisk filosofi eller i sammenlignende språkvitenskap. Det er et prisbeløp som ikke er uvesentlig: 200 000 NOK som skal være skattefrie.

Fra fagkomiteens begrunnelse: "Ottem ga allerede i sin PhD avhandling moteksempler til en formodning om positive metrikker på linjebunter, og kort etter, nye moteksempler til heltallformen til Hodge formodningen (som er ett av de store uavklarte områdene innen algebraisk geometri). Disse moteksempelene har han så senere videreutviklet til å vise at heltallformen til Hodge formodningen ikke holder for større klasser av trefoldigheter. På området rasjonalitet (et annet særdeles uavklart klassisk område) har Ottem med nye teknikker utvidet listen av generelle hyperflater som ikke er rasjonale. "



Fra venstre: Instituttleder Geir Dahl, Prodekan for forskning Bjørn Jamtveit og Prisvinner John Christian Ottem

SNART ER DET VALG...

Sainte-Laguës metode er en metode for å fordele mandater ved ulike former for valg som baserer seg på proporsjonal representasjon. Den er oppkalt etter den franske matematikeren André Sainte-Laguë.

Siden 1952 har metoden blitt brukt i valgo-rdningen i Norge. Metoden er en divisormetode. Etter at alle stemmene er blitt telt opp, blir suksessive kvotienter regnet ut for hver liste. Formelen for kvotienten er $\frac{V}{2s+1}$, der V er det totale antall stemmer partiet har fått, og s er antallet mandater partiet har fått så langt. Det partiet som nå har den høyeste kvotienten, får neste mandat, og dette partiets kvotient blir kalkulert på nytt, siden det nå har et nytt antall mandater så langt. Delingstallene blir derfor først 1, så 3, 5, 7, 9 og så videre. Prosessen fortsetter til alle mandatene er delt ut.

I Norge brukes en modifisert utgave av metoden, der det første delingstallet er 1,4. Ved å gjøre det første delingstallet større blir det vanskeligere å få det første mandatet sammenliknet med de påfølgende.



zbMATH Open

zbMATH Open – an Invitation to the Mathematical Community

zbMATH has been open access since 1st January 2021. Our database is now freely available to everybody worldwide.

We are taking this opportunity to invite the mathematical community to become involved in the future development of the database.

1. The zbMATH Open survey

We invite you to take part in our online survey

<https://www.surveymonkey.de/r/97W8J2K>

which will be open until 10th October 2021. We ask you to evaluate the current features of zbMATH Open and to comment on the future direction of the database.

2. Interlinking with other databases and community platforms

zbMATH Open provides links both to open digital libraries or repositories such as arXiv, ElibM, EuDML, and to external databases including wikidata and the Mathematics Genealogy Project. We aim to integrate as many mathematics open data as possible and interlink them with other databases and services. As zbMATH Open is now open access, it can contribute even more freely to the dissemination of knowledge and to the effective networking of all the different scientific services.

This can be seen with community platforms such MathOverflow . Since August 2017, MathOverflow users have been able to find bibliographical references in zbMATH Open and add them to discussions. The corresponding backlinks are automatically generated.

We invite the community to suggest and help us develop further links to other databases and services. Please contact us at editor@zbmath.org.

3. Open data

zbMATH Open provides free access not only to the database, but also to data which can be downloaded via an API, including all metadata and reviews. We invite you to use these data for research projects. For details see <https://oai.zbmath.org/>.

4. Looking for reviewers

The reviews written by experts constitute an essential and extremely valuable part of the database. They provide crucial information on published articles such as the historic background, the relationship to other publications and sometimes also information on problems concerning the validity of published results. Reviewing mathematical works is a valuable service to the mathematical community and is highly appreciated by your colleagues. In addition, your reviews will have a considerable visibility worldwide. Our current reviewer community consists of more than 7,000 experts worldwide. All the same, we are not able to cover as much of the mathematical literature as we would like to. You can provide a valuable contribution by becoming a reviewer:

<https://zbmath.org/become-a-reviewer/>

Reviewers receive compensation of EUR 3 for each review, as well as privileges for ordering books from the EMS Press.

With your help, zbMATH Open will improve and become a better mathematics service. Thank you for your contributions!

Klaus Hulek (Editor-in-Chief)