INFOMAT

NOVEMBER 2022

NOMINASJONER TIL HOLMBOE-PRISEN 2023

Kjenner du en matematikklærer som fortjener en pris? Holmboeprisen gis til en lærer eller en gruppe lærere i grunnskole eller videregående skole som har utmerket seg i sitt arbeid med matematikkfaget. Prisen, som er på 100 000 kr, er finansiert av Abelstyret ved det Norske Videnskaps-Akademi, og skal deles likt mellom prisvinneren og skolen som han eller hun kommer fra.

Alle kan nominere kandidater til Holmboeprisen. Det er mulig å nominere en enkelt lærer eller en gruppe lærere som sammen har gjort en innsats for matematikkfaget.

Holmboeprisen deles ut hvert år, neste gang i mai 2023.

Bernt Michael Holmboe, 1795-1850

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

2022

Desember:

1.-3. SCV-OSLO-CONFERENCE 2022, Univ. i Oslo
Marking the retirement of Erik Løw

5.-9. QUANTUM GROUPS: CURRENT TRENDS AND NEW PERSPECTIVES, Univ. i Oslo
<https://www.mn.uio.no/math/english/research/groups/operator-algebras/events/conferences/qg-2022/>

2023

Juni:

19.-23. OKA THEORY AND COMPLEX GEOMETRY CONFERENCE 2023, Nordfjordeid
<https://www.mn.uio.no/math/english/research/projects/granddrm/events/conferences/oka-theory-and-complex-geometry-2023/index.html>

August:

17.-18. NORWEGIAN NATIONAL Ph.D. MEETING, Trondheim
< www.nnpm.no>

Nye doktorgrader

Alexander Lobbe ved Univ. i Oslo forsvarte 25. november 2022 sin avhandling *Machine Learning for the Stochastic Filtering Problem* for graden PhD.

Veiledere har vært Professor Salvador Ortiz-Latorre, Univ. i Oslo og Professor Dan O. Crisan, Imperial College London.

Sammendrag:

This work explores the theoretical and practical ways of applying the successful class of artificial intelligence methods called 'neural networks' to the classical and important mathematical problem of filtering. Filtering is concerned with the question of how to extract an unknown signal from incomplete or corrupted observations and is important in applications, such as signal processing, engineering, and science.

Current state-of-the art methods to solve filtering problems have limitations, as the associated assumptions about the underlying signal are often not fulfilled in practice or additional methodologies are needed to handle problems with a large number of variables. The work presented in this PhD thesis resulted in a working deep learning algorithm for the filtering problem and documents all stages of development. The theoretical feasibility of our algorithm is studied and justified by rigorous mathematical arguments. The method is implemented in computer code and validated using challenging filtering problems. Notably, our new method has been designed so that it is able to deal with incoming signals 'on the fly'. Moreover, contrary to many classical methods, ours avoids explicitly 'tiling' space. Therefore, it may potentially be developed into an alternative for the computation of real-world problems with a large number of variables.

Nyheter

SØSTRENE DAHLS PRIS 2022

Styret for Søstrene Dahls legat har etter innstilling fra sin fagkomite bestemt å gi Professor Ingerid Dal og søster Ulrikke Greve Dals pris for humanistisk forskning 2023 til **Kenneth Aksel Hvistendahl Karlsen** for fundamentale bidrag i teorien for hyperbolske partielle differensiallikninger, og da særlig for løsninger av ikkelineære konserveringslover.

Prisen er på 200.000 kroner.

Prisen belønner arbeid innen sammenlignende og kontrastiv forskning på de indo-europeiske språkene, teoretisk matematikk og rasjonalistisk filosofi.

HEIDELBERG LAUREATE FORUM, 2023

Press release: November 11, 2022

Call for Applications: Participation in the 10th Heidelberg Laureate Forum for Outstanding Young Researchers in Mathematics and Computer Science. The application process for the 10th Heidelberg Laureate Forum has begun!

Young researchers in mathematics and computer science from all over the world can apply for one of the 200 exclusive spots to participate in the Heidelberg Laureate Forum (HLF), an annual networking conference. The HLF offers all accepted young researchers the unique opportunity to interact with the laureates of the most prestigious prizes in the fields of mathematics and computer science. Traditionally, the recipients of the Abel Prize, the ACM A.M. Turing Award, the ACM Prize in Computing, the Fields Medal, the IMU Abacus Medal and the Nevanlinna Prize engage in cross-generational scientific dialogue with young researchers in Heidelberg, Germany.

The application period for the 10th HLF runs from November 11, 2022, until February 11, 2023, midnight at the dateline. Young researchers at all phases of their careers (Undergraduate/Pre-Master, Graduate PhD or Postdoc) are encouraged to complete and submit their applications via the following link: http://application.heidelberg-laureate-forum.org

The 10th HLF will take place from September 24 to 29, 2023 (with young researcher registration taking place on September 23). This prominent, versatile event combines scientific, social and outreach activities in a unique atmosphere, fueled by comprehensive exchange and scientific inspiration. Laureate lectures and discussions as well as various interactive program elements are some of the Forum's fundamental elements, which are delivered in an environment that provides the space and time for unfettered exchange.

Over the course of the weeklong event, young researchers will have the chance to network and exchange Ideas with their peers ? 200 of the brightest minds from mathematics and computer science. They will also be given the exclusive opportunity to profoundly connect with their scientific role models and gain valuable insights by interacting with laureates in an unmediated and informal setting. As one young researcher put it: ?Meeting the humans behind some of the most formidable inventions and discoveries of our time was phenomenal. What was unexpected, perhaps, was how warm and approachable these individuals turned out to be. I am grateful to have been given this opportunity, and to have shared it with peers who I hope to soon call colleagues, collaborators and friends."

All applications that are completed and submitted by the deadline are meticulously reviewed by an international committee of experts to ensure that the most qualified candidates are invited. There are 100 spaces available for researchers from both mathematics and computer science, respectively. All applicants will be notified by the end of April 2023 about whether or not they have been selected.

For questions regarding the requirements and the application process, please contact Young Researchers Relations at: yr@heidelberg-laureate-forum.org

For more information, please visit: www.heidelberg-laureate-forum.org

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The Heidelberg Laureate Forum Foundation (HLFF) annually organizes the Heidelberg Laureate Forum (HLF), a networking conference where 200 outstanding young researchers in mathematics and computer science interact with the recipients of the most renowned prizes in their fields. The HLFF was established and is funded by the German foundation Klaus Tschira Stiftung (KTS), which promotes natural sciences, mathematics and computer science. The scientific partners of the HLF are

the Heidelberg Institute for Theoretical Studies (HITS) and Heidelberg University. The HLF is also strongly supported by the award-granting institutions: the Association for Computing Machinery (ACM), the International Mathematical Union (IMU) and the Norwegian Academy of Science and Letters (DNVA).

Internet: www.heidelberg-laureate-forum.org

Facebook: https://www.facebook.com/HeidelbergLaureateForum

Instagram: https://www.instagram.com/hlforum/ Twitter: https://twitter.com/HLForum

YouTube: www.youtube.com/LaureateForum

HLFF Blog: http://scilogs.spektrum.de/hlf/

Fllickr: https://www.flickr.com/photos/hlforum/albums

NORWEGIAN NATIONAL Ph.D. MEETING, Trondheim, August 17-18

Dear fellow PhD students.

We are organizing a Norwegian National Ph.D. meeting in Trondheim from the 17th to the 18th of August 2023. It will be accessible to all Ph.D. students in mathematics in Norway: that is, pure, applied, statistics and didactics. Based on the successful Ph.D. day at the National Mathematicians Meeting in Tromsø, this event shall be an opportunity to share experiences, connect research groups across Norway and give insight into career options after the Ph.D.

We aim to cover full board and accommodation expenses, possibly including travel expenses. You will find more information and the registration form on our webpage: www.nnpm.no

The form some of you filled out in September/October was NOT a registration Registration is now open and should be done as soon as possible on www.nnpm.no

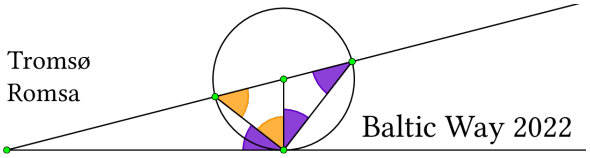
We strongly advise all Ph.D. students to sign up! Please forward this email to anyone you think might be interested.

Best regards, the organizing committee
at NTNU, UiB, UiA, UiS, UiO and UiT
nnpm.organizers@gmail.com

BALTIC WAY 2022, Tromsø, 10.-14. november

Årets Baltic Way ble i år gjennomført ved Universitetet i Tromsø. Til sammen 10 land fra hele det nordlige Europa deltok.

Baltic Way er i motsetning til IMO ingen individuell konkurranse, her løser nasjonslagene oppgavene sammen. Konkurransen består av 20 oppgaver, hver verdsatt til 5 poeng, dvs. en maksskår på 100. Det norske laget endte på 8. plass med 44 poeng. Seieren i konkurransen ble delt mellom Polen og Tyskland, begge med 75 poeng.



Her gjengir vi et lite utvalg av oppgavene:

Oppgave 3

Vi kaller et polynom $P(x,y)$ i to variabler *forkledd enkeltvariabelt*, hvis det eksisterer polynomer $Q(x)$ og $R(x,y)$ slik at $deg(Q) \geq 2$ og $P(x,y) = Q(R(x,y))$ (e.g. x^2+1 og x^2y^2+1 er forkledd enkeltvariable, mens $xy+1$ ikke er det).

Bevis eller motbevis følgende utsagn: Gitt at $P(x,y)$ er et polynom slik at både $P(x,y)$ og $P(x,y)+1$ kan skrives som et produkt av to ikkekonstante polynomer, så følger det at $P(x,y)$ er forkledd enkeltvariabelt.

Merk at alle polynomer er antatt å ha reelle koeffisienter.

Oppgave 5

La $\mathbb{R}$ være mengden av alle reelle tall. Finn alle funksjoner$f : \mathbb{R} \to \mathbb{R}$ slik at $f(0)+1 = f(1)$, og for alle reelle x og y så tilfredsstiller f likningen

$$f(xy-x)+f(x+f(y)) = yf(x)+3$$

Oppgave 13

La $ABCD$ være en syklisk firkant der $AB < BC$ og $AD < DC$. La E og F være punkter på sidene BC og CD, slik at $AB = BE$ og $AD = DF$. La M være midtpunktet på linjestykket EF. Vis at vinkelen $\angle BMD$ er rett.