



THE FACULTY OF SCIENCE
UNIVERSITY OF AARHUS

HEREBY CONFERS

Gunnar Hellmund

BORN *August 13, 1976*

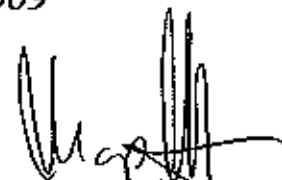
The PhD degree in Science

AS DEMONSTRATED BY THE THESIS ENTITLED

Lévy based Cox point processes

AARHUS, DENMARK, *April 2, 2009*


Erik Meinecke Schmidt
Dean


Mogens Nielsen
Head of PhD school

Ph.d.-uddannelsen
HOVEDVEJLEDER-UDTALELSE

| | |
|--|--|
| Ph.d.-studerende | Gunnar Hellmund |
| CPR-nummer | 130876. [REDACTED] |
| Årskortnummer | 19960312 |
| Institut | Institut for Matematiske Fag, Aarhus Universitet, Danmark |
| Ph.d.-uddannelsesprogram | Statistik |
| Ph.d.-afhandlingens titel | Lévy based Cox point processes |
| Dato for aflevering | 13. februar 2009 |
| Hovedvejleder | Eva B. Vedel Jensen |
| Projektvejleder (hvis forskellig fra hovedvejleder) | |
| Eventuelle andre vejledere | |
| Finansieringskilder | Det Naturvidenskabelige Fakultet |
| Artikler (opdeles i publicerede, indsendte, samt planlagte) | Publicerede artikler/artikler i trykken: [1] Gunnar Hellmund, Michaela Prokesova and Eva B. Vedel Jensen (2008): Lévy based Cox point processes. <i>Advances in Applied Probability</i> 40, 603-629. [2] Gunnar Hellmund (2009): Complete random signed measures. <i>Statistics and Probability Letters</i> , in press. Artikler, der skal indsendes: [3] Gunnar Hellmund and Rasmus Plenge Waagepetersen (2009). Strong mixing with a view toward spatio-temporal estimating functions. To be submitted to <i>Statistica Sinica</i> . |

| | |
|---|--|
| Udlandsophold (sted, periode) | Yale University, 14.-29. August 2008 |
| Undervisningsvirksomhed | Instruktør i kurserne Matematisk Modelering (F06, E06, F07, F08), Statistiske Modeller (E07) Forelæser ved den statistiske del af kurset Perspektiver i Matematisk Økonomi (E06, E07, E08) |
| Anden formidling | |
| Samlet vurdering af ph.d.-uddannelsens forløb (max. 1/2 side) | <p>Gunnar Hellmund startede sit ph.d. studium ved det Naturvidenskabelige fakultet 1. februar 2006. I de følgende 3 år er 3 videnskabelige publikationer blevet udarbejdet. Hovedvægten har været på modellering og statistisk analyse af Cox punkt processer. Artiklen [1] drejer sig om en ny fleksibel modelklasse af Cox processer, de såkaldte Lévy drevne Cox processer. En række kendte processer tilhører denne klasse, men også nye processer såsom log shot-noise Cox processer bliver konstrueret. Artiklen er publiceret i <i>Advances in Applied Probability</i>. Artiklen [2] er publiceret i <i>Statistics and Probability Letters</i>. Denne artikel besvarer væsentlige spørgsmål vedrørende sammenhængen mellem Lévy baser og tilfældige mål. I [3] gives strong mixing betingelser, der sikrer konsistens og asymptotisk normalitet af parameter estimater i et ikke-stationært set-up. Dette arbejde vil blive indsendt til et specialnummer af <i>Statistica Sinica</i> om composite likelihood.</p> <p>Gunnar Hellmund har deltaget i følgende videnskabelige møder:</p> <ul style="list-style-type: none"> - Stochastics in Science, 20-24 March 2006, Cimat, Guanajuato, Mexico - NordStat 2006 – 21st Nordic Conference on Mathematical Statistics, 11-15 June 2006, Rebild, Denmark - Summer school on biodiversity informatics, 13-18 August 2006, Sandbjerg, Denmark - Winter school on geometric measure theory, random sets and digital stereology, 22-26 January 2007, Sandbjerg, Denmark - Symposium on future stereology, 21-23 September 2007, Sandbjerg, Denmark - Workshop on composite likelihood methods, 15-17 April 2008, Warwick, England <p>Gunnar Hellmund har således gennemført sit ph.d. studium på fuldt tilfresstillende vis.</p> |

Dato:

13. februar 09

Eva B. Vedel Jensen
Hovedvejleder



Gunnar Hellmund

has on 30 January 2006 passed the examinations required for the

Master's degree in Statistics
at the University of Aarhus

and has thus been awarded the title of

cand.scient.

Master of Science, MSc
candidatus scientiarum

3 April 2006

A handwritten signature in black ink, appearing to read 'Erik Meinche Schmidt'.

Erik Meinche Schmidt
Dean



In accordance with the Danish Ministry of Education's Executive Order no. 694 of 30 August 1993 concerning studies in science at Danish universities, the Master of Science degree programme lasts 2 years in one or two fields of study. The programme aims to give students insight into theoretical and/or experimental methods on the basis of science and other subject areas to equip them for employment on an independent expert level or for taking part in scientific development work.

Gunnar Hellmund

has obtained the following results:

| | |
|--|----|
| Part 2 examination in Statistics | |
| 60 ECTS..... | 11 |
| in the courses: | |
| Generalized Hyperbolic Distributions | |
| Stochastic Geometry and its Applications | |
| Discrete Markov Processes | |
| One-Dimensional Diffusions | |
| Spatial Statistics | |
| Survival Analysis | |
| Stochastic Calculus 1 | |

Master's thesis and final oral examination

| | |
|--|----|
| Master's thesis and final oral examination in Statistics | |
| 60 ECTS..... | 13 |
| Lévy driven Cox processes with a view toward modelling tropical forests. | |

The Master's degree programme has been carried out on the basis of the Bachelor's degree programme in Statistics, which was completed at the University of Aarhus on 30 March 2005.

The validity of this document is confirmed
3 April 2006


Camilla Nygaard
Administrative Officer



Gunnar Hellmund

has on 30 March 2005 passed the examinations required for the

*Bachelor's degree in Statistics
(Part 1 Mathematics-Statistics)*
at the University of Aarhus

and has thus been awarded the title of

B.Sc.

Bachelor of Science, BSc

13 April 2005


Erik Meineche Schmidt
Dean



In accordance with the Danish Ministry of Education's Executive Order no. 694 of 30 August 1993 concerning studies in science at Danish universities, the Bachelor of Science degree programme lasts 3 years in one or two fields of study. The programme aims to give students insight into science and other scientific skills to equip them for employment or further study.

Gunnar Hellmund

has obtained the following results:

Part one Mathematics-Statistics

| | |
|--|--------|
| Mathematics 10 10 ECTS..... | Passed |
| Mathematics 11 20 ECTS..... | 11 |
| Probability 1 10 ECTS..... | 11 |
| Introduction to Programming 10 ECTS..... | Passed |
| Probability 2 and Statistics 1 40 ECTS..... | 11 |
| Geometry 1 10 ECTS..... | 13 |
| Algebra 1 10 ECTS..... | 10 |
| Complex Theory of Functions 10 ECTS..... | 13 |



Bachelor's year

| | |
|--|----|
| Analysis 1 10 ECTS | 13 |
| Stochastic Processes 10 ECTS | 11 |
| Statistics 2 20 ECTS | 11 |
| Statistics 3 10 ECTS | 11 |
| Bachelor's projects in Applied Statistics 10 ECTS | 11 |

The validity of this document is confirmed
13 April 2005

Helle B. Christens
Helle Bruus Christensen
Administrative Officer



Diploma Supplement

This Diploma Supplement follows the model developed by the European Commission, Council of Europe and UNESCO/CEPES. The purpose of the supplement is to provide sufficient independent data to improve the international 'transparency' and fair academic and professional recognition of qualifications. It is designed to provide a description of the nature, level, context and status of the studies that were pursued and successfully completed by the individual named on the original diploma to which this supplement is appended.

Gunnar Hellmund

Title conferred in Danish: **B.Sc.**

Title conferred in English: **Bachelor of Science, BSc**

Qualifications

Main fields of study:

The degree programme provides students with basic knowledge of mathematics, probability theory and statistics.

Awarding institution:

The University of Aarhus (Aarhus Universitet) is an independent institution under the public-sector administration and supervised by the Minister of Science, Technology and Innovation and regulated according to the University Act nr. 403 of 28 May 2003.

Language of instruction:

Teaching at the University of Aarhus takes place in Danish, although other languages may be used when appropriate.

Language of examination:

Examinations are conducted in Danish, unless their purpose is to demonstrate proficiency in languages other than Danish. If a subject has been taught in a language other than Danish, the examination concerned is conducted in this language, in accordance with the Danish Ministry of Education's Executive Order no. 1021 of 20 November 2000, section 5.¹

¹ Executive Order on examinations.



Level of Qualifications

In accordance with the Danish Ministry of Education's Executive Order no. 694 of 30 August 1993 concerning studies in science at Danish universities, the Bachelor of Science degree programme lasts 3 years in one or two fields of study. The programme aims to give students insight into science and other scientific skills to equip them for employment or further study.

Admission requirements:

Admission to Bachelor's degree programmes is subject to the regulations contained in the Danish Minister of Science, Technology and Innovation Executive Order no. 126 of 26 February 2004.²

Admission to Master's degree programmes is subject to the regulations contained in the ministerial orders for study programmes for the field of study concerned.

Contents and results

Mode of study:

Full-time.

Programme requirements:

The degree programme covers mathematics, probability theory and statistics. Information Technology (IT) is an integrated part of the statistics courses. In addition, there is an independent course on basic computer science, including programming. The purpose of the Bachelor's project is that students should document knowledge regarding the use of mathematics and statistics by completing practical projects.

Details and grades:

The grades achieved in degree programme examinations are shown in the attached diploma. Examination achievements are assessed either according to the Danish grading scale (the 13-point scale) or as passed/failed as contained in the Danish Ministry of Education's Executive order no. 513 of 22 June 1995.

Please see the attached description of The Danish Higher Education System.³

² Executive Order on admission.

³ Executive Order on the Danish grading scale.



Function of the qualification

Access to further study:

A Bachelor's degree in a given field of study qualifies graduates for admission to the Master's degree programme in the same field of study, providing the requisite number of student places are available.

A Master's degree in a given field of study qualifies graduates to apply for admission to the PhD research programme in the field concerned.

Additional information

The University of Aarhus, Ndr. Ringgade 1, DK-8000 Aarhus C, Denmark
www.au.dk

13 April 2005


Erik Meineche Schmidt
Dean


Helle Britta Christensen
Administrative Officer

Enkeltfagsbevis
for
akademiuddannelse

Navn: Gunnar Hellmund

Personnummer: 130876-1289

har i eksamensterminen November 2012

bestået følgende fag jf. undervisningsministeriets bekendtgørelse nr. 367 af 25. april 2012.

| Fag | Termin | ECTS-point | Karakter |
|----------------------------------|----------|------------|----------|
| LEAN-ledelse i praksis, mundtlig | nov 2012 | 10 | 12 A |

7-trinsskalaen

12: For den fremragende præstation.
10: For den fortrinlige præstation.
7: For den gode præstation.
4: For den jævne præstation.
02: For den tilstrækkelige præstation.
00: For den utilstrækkelige præstation.
-3: For den ringe præstation.

ECTS-skalaen

A
B
C
D
E
Fx
F

Skole: UCN - act2learn - LEDELSE & HR
Lindholm Brygge 35
9400 Nørresundby
Tlf 7269 7000



Nørresundby, november 2012

Søren Samuelsen
direktør

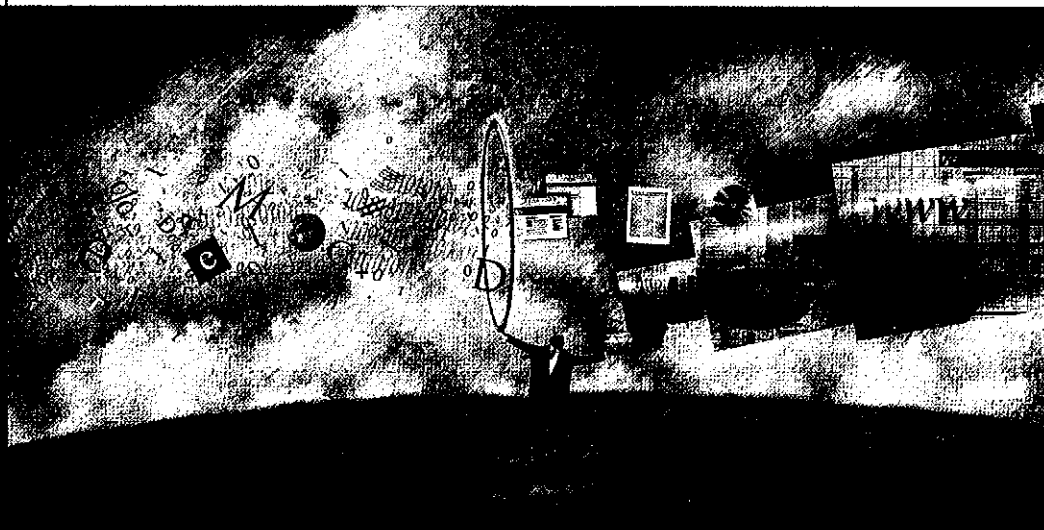
Kursusbevis

Kursus: Grundlæggende Programmering

Navn: Gunnar Hellmund

Dato: 13. - 15. januar 2003

Instruktør: Morten Kejser



SAS Institute A/S
Købmagergade 7-9
DK-1150 København K.
Tlf.: 7028 2870
Fax: 7028 2991

SAS Institute A/S
Kr. Kielbergvej 3
DK-8860 Skanderborg
Tlf.: 7028 2870
Fax: 7028 2634

www.sas.com/dk



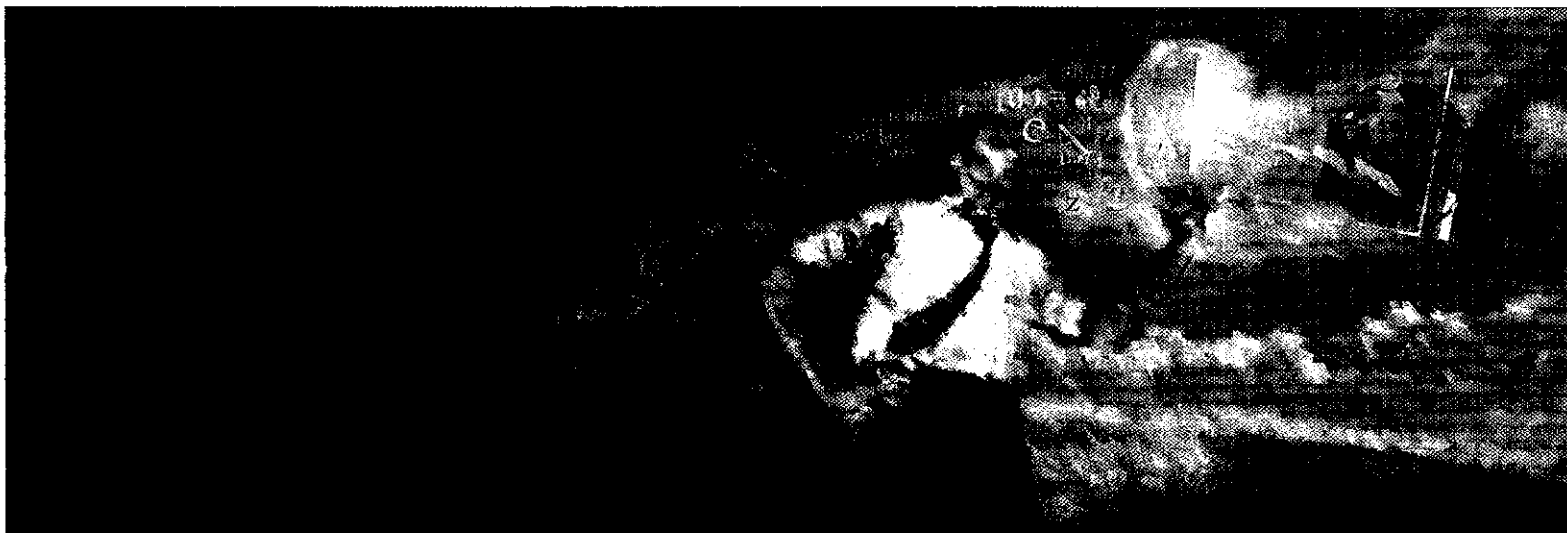
Kursusbevis

Kursus: Videregående Programmering

Navn: Gunnar Hellmund

Dato: 16. – 17. januar 2003

Instruktør: Kenn Jakobsen



The Power to Know.



960312
Gunnar Hellmund
Grenåvej 681 K, St, -73
8541. Skødstrup

Udskrift af Aarhus Universitets eksamensregister den 30. juli 1998

Gunnar Hellmund
Født den 13. august 1976
Årskortnr. 960312

Har bestået følgende prøver:

Med bedømmelsen

| | |
|--|------------|
| * Bacheloruddannelse i matematik, 1. del i mat-fys | |
| > 1. del i matematik-fysik | |
| > 1. Årsprøve (1. del i mat-fys) | Bestået |
| > Matematik 10 | Bestået |
| > Matematik 11 | Bestået 11 |
| > Fysik 11 | Bestået 11 |
| > Sandsynlighedsteori 1 | Bestået 11 |
| > Bachelorprogram i matematik (1. del i mat-fys) | |
| > Valgfri matematik (2-4 point) | Bestået |
| > Geometri 1 | Bestået 13 |

Eva Teilmann

kontorchef

Studentereksamensbevis - Matematisk linje

aflagt i henhold til gymnasiebekendtgørelsen af 19. maj 1993

Navn: **Hellmund, Gunnar**

CPR-nr.:

Eksamensår: **1995**

Obligatoriske fag

| | Niveau | Års-karakter | Eksamens-karakter | Inst.nr. | Termin | Merit | |
|----------------------------------|----------------------|--------------|-------------------|----------|--------|--------|---|
| Billedkunst (vægt 1/2) | C | 10 | | 851061 | jun 95 | - | |
| Biologi | C | 10 | 10* | 851061 | jun 93 | - | |
| Dansk, skriftligt | A | 11 | 11 | 851061 | jun 95 | - | |
| Dansk, mundtligt | A | 10 | 10* | 851061 | jun 95 | - | |
| Engelsk | B | 10 | 11 | 851061 | jun 94 | - | |
| Fysik | B | -- | -- | 851061 | jun 94 | - | |
| Geografi | C | 10 | 11 | 851061 | jun 94 | - | |
| Historie | A | 10 | 10* | 851061 | jun 95 | - | |
| Idræt (vægt 1/2) | - | -- | | - | - | - | |
| Kemi | C | 9 | 9* | 851061 | jun 93 | - | |
| Matematik, skriftligt | B | -- | -- | 851061 | jun 94 | - | |
| Matematik, mundtligt | B | -- | -- | 851061 | jun 94 | - | |
| Musik (vægt 1/2) | C | 9 | | 851061 | jun 93 | - | |
| Oldtidskundskab | C | 11 | 13 | 851061 | jun 95 | - | |
| Religion | C | 10 | 13 | 851061 | jun 95 | - | |
| Fortsættersprog Begyndersprog | Tysk fortsættersprog | B | 9 | 9* | 851061 | jun 94 | - |
| | | - | -- | - | - | - | |
| Større skriftlige opgave | Samfundsfag | | | 11 | 851061 | jun 95 | - |

Valgfag på mellemniveau

| | | | | | | |
|--|---|----|----|---|---|---|
| | - | -- | -- | - | - | - |
| | - | -- | -- | - | - | - |

Valgfag på højt niveau

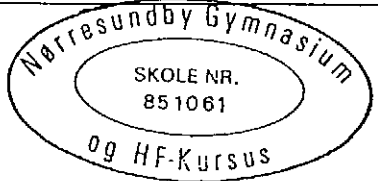
| | | | | | | |
|------------------------|---|----|-----|--------|--------|---|
| Fysik, skriftlig | A | 11 | 11 | 851061 | jun 95 | - |
| Fysik, mundtlig | A | 10 | 10* | 851061 | jun 95 | - |
| Matematik, skriftlig | A | 11 | 11 | 851061 | jun 95 | - |
| Matematik, mundtlig | A | 11 | 11* | 851061 | jun 95 | - |
| Samfundsfag, skriftlig | A | 11 | 13 | 851061 | jun 95 | - |
| Samfundsfag, mundtlig | A | 11 | 11 | 851061 | jun 95 | - |

| Særkarakterer i skriftlig matematik | | |
|-------------------------------------|-------------------------|-----------------------|
| Obl. niveau (v: 1/3) | Højt niveau (v: 2/3) | Eksamens- karakter |
| 11 | 11 | 11 |

| | Årskarakter | Eksamens- karakter |
|------------|-------------|-----------------------|
| Gennemsnit | 10,3 | 10,9 |

Eksamensresultat **10,6**

Bemærkninger:



23. juni 1995 Peter Rugholm
 Datum Rektor Skole/kursus