# Computer Science
**DIS Study Abroad in Scandinavia**

## Overview

DIS -Study Abroad in Scandinavia offers Computer Science in Stockholm and Copenhagen during both the semester (spring and fall) and summer. The courses approach the academic content from a Scandinavian lens and are integrated with experiential learning concepts. During the spring or fall, students enroll in one core course (with course-integrated study tours within Sweden/Denmark and in different locations throughout Europe) and three or four elective courses.

Students in the summer can choose to take 3 to 9 credits over 3 to 9 weeks and can choose to stay in either Copenhagen or Stockholm, or a mix-and-match of both locations.

## Semester Core Courses with Prerequisite Information

**Computer Science** courses (syllabi, study tour info, and prerequisites can be found on each course's site):

**Artificial Neural Networks and Deep Learning** **(Copenhagen)**, Fall/Spring, 3 credits
*Prerequisites: One year of computer science at university level. One of the computer science courses should be in algorithms and data structures. One course in either probability theory, linear algebra, or statistics at university level. Knowledge of programming languages (e.g. in Python/Javascript/Java/C++/Matlab).*

- Week-Long Study Tour:  London
- Core Course Week Study Tour:  Denmark

**Game Development: Programming and Practice** **(Copenhagen)**, Fall/Spring, 3 credits
*Prerequisites: One year of computer science and one mathematics course at university level. Knowledge of at least one programming language, preferably with object-oriented programming such as Java, C# or C++.*
- Week-Long Study Tour:  Berlin-Hamburg or Berlin-Frankfurt
- Core Course Week Study Tour:  Denmark

**Machine Learning** **(Stockholm)**, Fall/Spring, 3 credits

*Prerequisites: One year of computer science, a course in algorithms and data structures, one course in linear algebra at university level. A course in statistics is recommended. Knowledge of at least one programming language (e.g., Python/Javascript/Java/C++/Matlab).*

- Week-Long Study Tour: London (Fall) or Berlin (Spring)
- Core Course Week Study Tour: Sweden

## Semester Elective Courses with Prerequisite Information

- [App Development](#) (Fall/Spring, 3 credits, Stockholm)
  *Prerequisites: One year of computer science at university level. One of the computer science courses should be in algorithms and data structures. Knowledge of one object-oriented programming language (such as Javascript, C#, Java or C++). Basic knowledge of web development and databases is recommended.*
- [Artificial Intelligence](#) (Fall/Spring, 3 credits, Copenhagen) and [Artificial Intelligence](#) (Fall/Spring, 3 credits, Stockholm, begins Fall 2024)
  *Prerequisites: One year of computer science at university level. One of the computer science courses should be in algorithms and data structures. Experience with object-oriented programming (e.g. Java, Python). A course in discrete mathematics is recommended.*
- [Computational Analysis of Big Data](#) (Fall/Spring, 3 credits, Copenhagen)
  *Prerequisites: One year of computer science at university level and a course in algorithms and data structures. Knowledge of at least one programming language (e.g. Python, Javascript, Java, C++, Matlab).*
- [Computer Graphics: Programming 3D Applications](#) (Fall/Spring, 3 credits, Copenhagen)
  *Prerequisites: Three computer science courses and one mathematics course at university level. Knowledge of at least one object-oriented programming language (e.g. Java, C#, C++, Javascript). Knowledge of linear algebra is recommended.*
- [Data Visualization](#) (Fall/Spring, 3 credits, Stockholm)
  *Prerequisites: One mathematics course at university level.*
- [Game Development Lab](#) (Fall/Spring, 3 credits, Copenhagen)
  *Corequisite course: Game Development*
- [Philosophy of Technology and Human Values](#) (Fall/Spring, 3 credits Stockholm)

## Summer 2024 Computer Science Courses

**Session 1 (May 21 - June 12, 2024)**

- [Development and Programming of Serious Games](#) (Copenhagen)
  *Prerequisites: One year of computer science and one calculus course at university level. Knowledge of at least one programming language such as Java, C#, C, C++, or JavaScript.*

**Session 2 (June 16 - July 5, 2024)**

- [Artificial Neural Networks and Deep Learning](#) Copenhagen)

*Prerequisites: One year of computer science at university level. One of the computer science courses should be in algorithms and data structures. One course in either probability theory, linear algebra, or statistics at university level. Knowledge of programming languages (e.g. in Python/Javascript/Java/C++/Matlab).*

## Session 3 (July 8 – July 27, 2024)

- [Artificial Intelligence](#) (Copenhagen)
  *Prerequisites: One year of computer science at university level. One of the computer courses should be in algorithms and data structures. Experience with object-oriented programming (e.g. Java, Python). A course in discrete mathematics is recommended.*

## Labs, Research, & Practicums Session (May 21 - July 5, 2024)

- [Research Assistantship: Understanding Human Behavior in Games](#)
  *Prerequisites: One research methods course, and one year of either psychology, game design, or media studies, all at university level.*

# Program Director

**Natalia Landázuri Sáenz,**
*Ph.D., Department of Biomedical Engineering, Georgia Institute of Technology, Atlanta, GA, USA (2005).*
- Postdoctoral fellow, Emory University, Atlanta, GA, USA.
- Associate Professor Biomedicine, Karolinska Institutet, Stockholm, Sweden.
- Fulbright scholar (1999-2001).

Research in genetic engineering, cell and gene delivery vehicles, mathematical modeling, bioengineering approaches for cardiovascular disease, and cancer. Has created, designed, implemented and evaluated courses at university level. Acted as Pedagogical Advisor, Development and Regeneration Doctoral Program, Karolinska Institutet. Has participated in national and international committees to evaluate and promote scientific and academic advancements. With DIS since 2017.

# Faculty

**Thomas Bolander** (Copenhagen)
*Ph.D. M.Sc., Mathematics, Logic, Computer Science and Artificial Intelligence, Technical University of Denmark (DTU), Copenhagen, Denmark (2003).*

Professor, Department of Applied Mathematics and Computer Science, DTU. Recipient of the "teacher of the year" award at DTU (2006). Director of studies at the Copenhagen University Extension (2009-2013). Educational developer at LearningLab, DTU (2011-2014). Book review editor of the Springer journal "Studia Logica". Scientific advisor for the "Science & Cocktails" initiative, Copenhagen.

**Lorenzo Belgrano** (Copenhagen)
*Mathematical Modelling and Computation degree from DTU, 2019.*

Machine Learning Engineer at Corti from 2019 - present. With DIS since 2023.

**Alfio Brancozzi** (Stockholm)
*Developer at Funnel AB, Stockholm, Sweden.*
- Bachelor of Science in Computer Engineering, KTH (Royal Institute of Technology), Stockholm (2020).
- Bachelor of Commerce, University of Queensland, Brisbane, Australia (2009).

Previous experience in cross-platform mobile app development from launching an endometriosis symptom-tracking app for a Stockholm-based health tech startup. Currently working with backend API integrations for marketing analytics. With DIS since 2023.

**Nina Gierasimczuk** (Copenhagen)
*Ph.D. in Computer Science, Institute for Logic, Language and Computation, University of Amsterdam, Netherlands (2010).*

Associate Professor, Technical University of Denmark (DTU) (2018-present). M.A., Institute of Philosophy, University of Warsaw (2005). B.F.A., Fine Arts, Gerrit Rietveld Academy, Amsterdam, Netherlands (2021). Research focus on logical and computational aspects of learning in artificial intelligence. With DIS since 2023.

**Faris Halteh** (Stockholm)
*Senior Software Engineer at Spotify, Stockholm, Sweden. Masters in Computer Science, Uppsala University, Sweden (2015).*

Has over 8 years of experience building iOS apps at several companies, including his current position at Spotify. Has also specialized in Human-Computer Interaction and Product Design. With DIS since 2023.

**Nicolai Frost Jacobsen** (Copenhagen)
*M.Sc. Dual Degree in Data Science, Technical University of Denmark & Korea Advanced Institute of Science and Technology.*

Machine Learning Engineer & Manager at the Health Tech Startup Corti. Worked as a statistician for the Meteorological Institute of Denmark. Data Science & BI consultant for IQVIA and currently lecturer at Copenhagen Business School.  With DIS since 2022.

**Lucian Leahu** (Copenhagen)
*Ph.D., Cornell University, USA (2012). Assistant professor at ITU Copenhagen (2015-2018).*
- *ERCIM Postdoctoral Fellow at the Swedish Institute of Computer Science (2012-2013).*

Project Leader in the Media Technology and Interaction Design Department at the Royal Institute of Technology (2014). With DIS since 2019.

**Benno Lüders** (Copenhagen)
*M.Sc. Game Technology, IT University of Copenhagen, Denmark (2016).*

Game enthusiast and game development all-rounder with focus on Game Programming. Assistant teacher at the Royal Academy of Fine Arts in Copenhagen (2015-2016). Tutor and

teaching assistant at the IT University of Copenhagen (2015), and Hochschule Fulda (2011-2013). Backend Java developer at mobile game company Flaregames in Karlsruhe, Germany (2013-2014). With DIS since 2016.

**Angie Dag Morozov** (Stockholm)
*Head of software at Gapminder Foundation, Stockholm, Sweden.*
- M.Sc. in Human Computer Interaction with minor in Innovation and Entrepreneurship, KTH (Royal Institute of Technology), Sweden and Aalto, Finland (2014).
- M.Eng. Industrial Automation and Control Systems, URFU, Russia (2011).

Responsible for software efforts of gapminder.org/tools, and for developing interactive data pictures. d3.js data graphics developer. Has built data-intense visualizations for oil platform safety monitoring (ABB Research, Sweden), user interfaces for online payment aggregator (Robokassa, Russia), control systems and operator user interfaces for ore processing factory (Realtime Software, Russia). With DIS since 2022.

**Peter Rasmussen** (Copenhagen)
*Ph.D. in Computer Science, University of Copenhagen, Denmark (2021).*

Research focus on algorithms, in particular research in hashing algorithms, graph algorithms, graph theory, and computational geometry. Data Scientist, development and deployment of machine learning algorithms, Halfspace, Copenhagen, Denmark (2021-2022). With DIS since 2023.

**Daniel Svendsen (**Copenhagen)
*Ph.D. in Electrical Engineering, University of Valencia, Spain (2020).*

Research focus on the incorporation of physical knowledge in machine learning models. Data science consultant to various startups, including eeSea and Pensure (2020). MSc in Mathematical Modelling and Computation, Technical University of Denmark (2016). Teaching assistant (2015-2016). With DIS since 2021.