

Human AI

SYLLABUS

VU Amsterdam Summer School

July 6, 2024 – July 20, 2024



Any general questions for the Summer School support team? Contact amsterdamsummerschool@vu.nl.

Course Details

You can recycle the information that can be found on the webpage to fill in the following sections. Please bear in mind that the syllabus is a key element of the course that helps students to decide whether this course is appropriate for them and can really help them when deciding to join. Make sure to be as detailed as possible.

Title	Human AI
Coordinator(s)	Prof.dr. Jan Treur
Other lecturers	
Study credits	3 ECTS
Form(s) of tuition	On campus,
Approximate contact hours	60
Approximate self-study hours	15

Teaching staff (in order of appearance)

Prof.dr. Jan Treur

Course description

Human processes of all kinds are complex and adaptive. Mental, social, and health-related processes can all change and adapt over time with human behaviour. Mental processes can change as a result of learning, social interactions can evolve over time, and health-related processes are susceptible to change too. This course will present theories and findings from a wide range of disciplines, including various branches of cognitive, social, health and neuroscience, to gain insight into underlying mechanisms of human processes that can be exploited in human AI modeling and simulation. The various scientific theories form a factual basis for modelling the processes. We can understand these often adaptive mechanisms through causal relations and causal pathways, which form adaptive dynamical systems that we can model as networks. Using this theoretical framework and the software provided, students can easily simulate a variety of scenarios. During the second week, students will carry out activities that may lay the foundations for a publication that can be finished later on. This course introduces a network-oriented modelling approach based on adaptive networks. This approach is useful for modelling dynamical systems for social interactions and mental and health-related processes. These network models cover the

dynamics of causal effects, changing causal connections and excitability or sensitivity thresholds. Higher-order adaptiveness is another topic covered in the course, which includes the role of metaplasticity and the extent to which plasticity occurs in mental or neural processes.

Learning objectives

Assignments and Assessment

The course includes 7 Assignments in the first week and a Final Assignment in the second week. Assessment will be based on these assignments on a 50/50 basis for the first week and second week.

Provisional reading list

Chapters from the following two books on the topic (from the 2016 book, chapters 2, 3, 7, 11; from the 2020 book 2 chapters 1, 2, 3, 4, 6, 7, 9); in addition, some papers:

Treur, J. (2016). *Network-Oriented Modeling: Addressing Complexity of Cognitive, Affective and Social Interactions*. Springer Publishers. Within the university freely downloadable at <http://link.springer.com/book/10.1007/978-3-319-45213-5>. Table of Contents with links to abstracts and slides per chapter: <https://www.researchgate.net/publication/305930006>

Treur, J. (2020). *Network-Oriented Modeling for Adaptive Networks: Designing Higher-Order Adaptive Biological, Mental, and Social Network Models*. Springer Publishers. Within VU or UvA freely downloadable at: <https://link.springer.com/book/10.1007/978-3-030-31445-3>. Table of Contents with links to abstracts and slides per chapter: <https://www.researchgate.net/publication/334576216>

Course Schedule

See the added Excel file



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11-jul	11-jul	12-jul	12-jul
Thursday Morning	Thursday Afternoon	Friday Morning	Friday Afternoon
8:30 - 9:00 lecture	12:30 - 13:00 lecture	8:30 - 10:00 lecture	12:30 - 13:00 lecture
Lecture 6: Evolutionary Network Models and Strange Loops	Lecture 7: Network Models Using Adaptive Internal Mental Models	Lecture 8: Analysis of Behaviour of Network Models	Lecture 9: What remains
Book 2 Ch 7. Modeling Higher-Order Adaptive Processes in Evolution	On Dynamics, Adaptation and Control of Internal Mental Models	Book 2 Ch 12. Analysis of a Network's Emerging Behaviour	Final Assignment
Book 2 Ch 8 Self-Modeling Network Models with a Strange Loop.	Examples of publications based on Final Assignments	Book 1 Ch 14. Who Are You?	Final Assignment
9:00 - 12:00 practical session	13:00 - 15:30 practical session	10:00 - 12:00 practical session	13:00 - 15:30 practical session
Assignment 6: Designing an Adaptive Social Network Model	Assignment 7: Designing a Second-Order Adaptive Network Model for Organisational Learning: How to Organise a Party	Final Project Assignment: choice of a topic	Final Project Assignment
18-jul	18-jul	19-jul	19-jul
Thursday Morning	Thursday Afternoon	Friday Morning	Friday Afternoon
8:30 -15:30 Supervised group work	8:30 -15:30 Supervised group work	8:30-15:30 10 minute presentations	Goodby drink
Final Project Assignment	Final Project Assignment	Final Project Presentation	