



GEORGETOWN UNIVERSITY
School of Continuing Studies
Bachelor of Arts in Liberal Studies

AI and Transhumanism

Artificial Intelligence: New Developments and Implications on Transhumanism

(BLHV 464)

Provisional Syllabus, Spring 2019

Notice: Please make sure to read carefully the Attendance paragraph: this is a course with lectures being taught by the instructor live but remotely (online) using teaching tools like: Blackboard Collaborate and/or Zoom

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This is a three-credit course

Course Description

- **AI (Artificial Intelligence)** is everywhere around us; it is sophisticated, it is pervasive and the pace of new developments is frantic. Its applications are in every domain of activity of humans and its rapid development is creating anxiety that soon will achieve equivalence to human's intelligence with the real possibility of evolving into a superintelligence that could create "posthumans" with drastic implications on humanity, as we know it today.
- It is important to understand how did the AI arrive in our lives; historically it appeared as a well-defined technology after WWII after the invention of the digital computer. However, beyond being used for fast computations in science, very soon it took a life of its own with the claims that the brain and the mind are similar with the hardware and the software of a computer. Are these claims correct?
- We will review scientific and technological fundamentals of AI and describe the architecture of computers and how algorithms implemented in software are achieving these remarkable properties in all areas where AI is so successful: designing autonomous robots, speech recognitions, navigation (GPS), medical disease diagnostics, self-driving vehicles and many others.
- All these remarkable successes created an optimistic mood among people who believe in the capabilities of technology to improve the lives of humans in the future and in the process to transform them into a new race of "post-humans"; sometimes called techno-futurists, they created a large movement across all sections of the society known as transhumanism
- Transhumanism is the belief that technology can allow us to improve, enhance and overcome the limits of our biology. More specifically, transhumanists believe that by merging man and machine via biotechnology, molecular nanotechnologies and artificial super intelligence, one day science will yield humans that have increased cognitive abilities, are physically stronger, emotionally more stable and have indefinite life-spans. This path, they say, will eventually lead to "posthuman" intelligent (augmented) beings far superior to man - a near embodiment of god
- Critics, although accepting the premise of accelerated technological developments (called Technological Singularity) in all these areas, are much more pessimistic about outcomes; they are emphasizing ways in which these science/technology trends could bring existential threats to mankind and are using the Fermi paradox (The apparent size and age of the universe suggest that many technologically advanced extraterrestrial civilizations ought to exist; however, this hypothesis seems inconsistent with the lack of observational evidence to support it) to posit that super advanced civilizations tend to self-destruct.
- Which position is right? Where would the balance tilt: happy outcomes or terribly destructive ones? Are the trends and their consequences real? If they are, what are the desired paths humans should take to maximize the benefits and minimize the perils? These are no easy yes/no answers; the method we will use to bring some light is to understand the implications of different (possible) scenarios and develop a sensitivity analysis of factors that could change the outcomes and those factors may give an indication of directions to follow for positive results.
- We will analyze arguments on both sides and try to understand the ethical, social and religious implications of these concepts that seem futuristic but whose consequences could be closer than what it appears given the accelerated progression of remarkable scientific developments (especially during last century)

- We cannot ignore these problem; the genie (or better said the genies) of biotech/genetics, artificial intelligence, nanotechnology are already out of the bottle(s) and we (the humans) better make the right decisions in the coming decades or else?

This course is intended to give students an overview of a number of hot topics at the intersection of technical, scientific, ethical and religious debates in our society. Specifically, by the end of this course, students should be able to understand the major facts about the accelerated development of scientific concepts and technologies:

1. Understand what artificial intelligence (AI) is and how it is implemented; what are the basic structures of digital computers, what are the algorithms and how algorithms are able to implement the today's applications like: speech recognition, robots, self-driving vehicles, etc.
2. Understand the fundamental philosophical assumptions of artificial intelligence and how these assumptions reinforce the belief that future technological developments could lead to artificial super-intelligence (ASI) that would be potentially superior to humans cognitive capabilities
3. Understand what the concepts of Transhumanism and Technological Singularity (TS) are and their relationship to AI
4. Understand key trends about genetics, nanotechnology and advanced robotics which could lead to Singularity
5. Become aware of potential dangers in developing these technologies (existential threats) and ways of mitigating these perils by developing checks and balances within research projects for ASI, genetics and nanotechnology
6. Review the ethical, social and religious implications of these developments and get involved in debating the options

In addition to these substantive goals, students will further develop their writing, oral communication, and analytical skills. Specifically, students will be expected to:

1. Write clear, precise papers that develop stringent arguments and provide solid evidence for their claims. Make sure to follow the MLA style of citations (<http://www.citationmachine.net/mla/cite-a-website>)
2. Orally present their ideas in a logical and cogent style; develop and exercise debate skills.
3. Develop their understanding of historical explanation and evaluation of facts

Evaluation

Students are expected to attend lectures, read assigned texts, submit term paper & essays, and participate in discussion and debates, as well as display an ability to absorb, comprehend, and analyze the course material.

Course Requirements

§ Reading Assignments (see below)

§ Submit two analytical essays (4 to 5 pages each, max) on assigned readings. (Topics will be distributed in advance.)

§ Submit one 10-15 page term paper at the end of the semester

§ Oral Presentation: a 10-15 minute review of your semester paper

§ Actively participate during the class by answering questions and by presenting assignments from the instructor and by taking assigned quizzes (the first quiz would be within the first two weeks)

Study Groups

Depending on class size, study groups will be formed to prepare class presentation(s) and defend (at least) one debate on assigned topics

Grading Policy

This is a three-credit course

Final grade for the course will be based on the following:

1. Class Participation (including tests, quizzes, debate participation) 25%
2. Analytical Essays 30% (15 X 2)
3. Final Exam Paper 30%
4. Oral Presentation 15%

Grade Table

93-100 % = A (superior)
90 - 92 % = A-
87 - 89 % = B+ (very good)
83 - 86 % = B (good)
80 - 82 % = B-
77 - 79 % = C+

Disabilities Statement

If you are a student with a documented disability who requires accommodations or if you think you may have a disability and want to inquire about accommodations, please contact the Academic Resource Center at 202-687-8354 or arc@georgetown.edu

Turnitin.com

Students acknowledge that by taking this course all required papers can be submitted for a Textual Similarity Review to Turnitin.com for the detection of plagiarism. Use of the Turnitin.com service is subject to the terms of use agreement posted on the Turnitin.com site.

Extreme weather, Emergencies, and Instructional Continuity

During inclement weather or other emergencies on a day when we are scheduled to meet face-to-face, check the university's Web site or call (202) 687-7669 for information on whether the university is open. If the university is open, this class will meet. If the university is closed, this class will meet through distance means such as online videoconferencing; check your e-mail for a message from me on how we will proceed in that situation. Due dates for written assignments submitted through Blackboard will not be changed due to campus closings. The university recently has acquired the capability to send text messages and recorded messages about emergencies to cell phones and other mobile devices. Sign up on MyAccess.

Georgetown Honor System

All students are expected to follow Georgetown's honor code unconditionally. We assume you have read the honor code material located at <http://scs.georgetown.edu/academic-affairs/honor-code>, and in particular have read the following documents: Honor Council Pamphlet, What is Plagiarism, Sanctioning Guidelines, and Expedited Sanctioning Process. Papers in this course will all be submitted to turnitin.com for checking. Submitting material in fulfillment of the requirements of this course means that you have abided by the Georgetown honor pledge:

In the pursuit of the high ideals and rigorous standards of academic life, I commit myself to respect and uphold the Georgetown Honor System: To be honest in any academic endeavor, and to conduct myself honorably, as a responsible member of the Georgetown community, as we live and work together.

Plagiarism In accord with university policy, all incidents of suspected plagiarism or other Honor Code violations will be reported to the Honor Council without fail. If the Honor Council finds that a student has plagiarized or has violated the Honor Code in any other way, the student may receive a grade of F for the course.

Policy Accommodating Students' Religious Observances

The following is university policy:

Georgetown University promotes respect for all religions. Any student who is unable to attend classes or to participate in any examination, presentation, or assignment on a given day because of the observance of a major religious holiday or related travel shall be excused and provided with the opportunity to make up, without unreasonable burden, any work that has been missed for this reason and shall not in any other way be penalized for the absence or rescheduled work. Students will remain responsible for all assigned work. Students should notify professors in writing at the beginning of the semester of religious observances that conflict with their classes.

Title IX at Georgetown
<https://titleix.georgetown.edu/>

Sexual Misconduct

Title IX of the Education Amendments of 1972 ("Title IX") prohibits discrimination based on sex in any educational programs, which includes sexual harassment or any acts of sexual misconduct. Title IX requires the University, upon becoming aware of any incident of sexual harassment and misconduct to respond appropriately to protect and maintain the safety of the University community, including students, faculty, and staff. Georgetown University prohibits sexual misconduct, including sexual harassment, sexual assault, domestic/dating violence, and stalking. Discrimination based on sex, including sexual misconduct and discrimination based on pregnancy or parenting status, subverts the University's mission and threatens permanent damage to the educational experience, careers, and well-being of students, faculty, and staff.

Please know that as a faculty member I am committed to supporting survivors of sexual misconduct, including relationship violence and sexual assault. However, University policy also requires me to report any disclosures about sexual misconduct to the Title IX Coordinator, whose role is to coordinate the University's response to sexual misconduct.

Georgetown has a number of fully confidential professional resources who can provide support and assistance to survivors of sexual assault and other forms of sexual misconduct. These resources include:

Jen Schweer, MA, LPC

Associate Director of Health Education Services for Sexual Assault Response and Prevention

(202) 687-0323

jls242@georgetown.edu

Erica Shirley

Trauma Specialist

Counseling and Psychiatric Services (CAPS)

(202) 687-6985

els54@georgetown.edu

Pregnancy Adjustments and Accommodations

Georgetown University is committed to creating an accessible and inclusive environment for pregnant and parenting students. Students may request adjustments based on general pregnancy needs or accommodations based on a pregnancy-related complication. Specific adjustments will be handled on a case by case basis and will depend on medical need and academic requirements.

Students seeking a pregnancy adjustment or accommodation should follow the process laid out at: <https://titleix.georgetown.edu/student-pregnancy>.

Devices

The use of electronic devices (mobile phones for calls/texting, games, pagers, etc) during class is strictly forbidden. Anyone text-messaging or emailing in class will be asked to leave and will be listed as absent.

Audio/video recording of classroom lectures and discussions is not permitted.

Laptop computers may be used for *note-taking, without internet surfing*.

Readings Assignments

Required readings for each class are listed below, and should be completed before the class period. All others are highly recommended, and may be referred to in class. Other articles and supplemental materials will be uploaded to Blackboard and/or will be made available in class. Students are responsible for accessing articles, other materials and assignments on Blackboard and/or reserves (regular and electronic) at Lauinger Library

!!!! Important Information about Attendance !!!!

Attendance is mandatory; keep in mind that this is a remotely taught course using remote teaching tools we have at our disposal: Blackboard Collaborate and especially Zoom. It is necessary that students should be able to possess and use during lectures adequate laptops and standard audio headphones and a video camera; students are required to keep the video camera on during the lectures and class discussions to help enhancing the "in the classroom feeling" among the participants.

It is important to notice that this presents some advantages for students; if they have good bandwidth Internet connections at home they will be able to attend the lecture from home. If they don't have adequate bandwidth for their home Internet connections, they still could attend the remotely taught lectures by going to the classroom assigned (at 640 Mass Ave) where there is a good network connection (SaxaNet - provided by the university) that allows them to follow the lecture.

Also, there are going to be individual, video, one-on-one sessions as required with every student (again, using remote teaching tools) that will help with personal guidance in answering questions and clarifying issues related to the material taught and to the essays and examinations subjects.

Students with two absences for any reason may receive a failing grade for the course. If you miss a class it is your responsibility to make up any assignments on time and obtain class handouts. Students are expected to behave during class in accordance with the Code of Campus Conduct.

Late Assignments

No credit will be given for any assignment that is submitted late without the prior approval of the instructor. Prior approval means the student has communicated with the instructor before the assignment deadline. An assignment that is submitted late with the instructor's approval will have its grade reduced by 10 percent for every day it is late.

Instructional Continuity Policy

We will follow the university policy on Instructional Continuity, which states: "Instructional activities will be maintained during University closures. Faculty members should prepare for the possibility of an interruption of face-to-face instruction by establishing a policy within the course syllabus to maintain instructional continuity in the case of an unforeseen disruption. During a campus "closure," the regular class time schedule must be honored by all campus departments so that students will remain available for those faculty members who wish to maintain continuous academic progress through synchronous distance instruction". In case of disruption students will be required to call a telephone bridge number, which will be announced during first lecture, and use one the tools as assigned by the instructor. (either Zoom or Blackboard Collaborate)

It is important to notice that the Instructional Continuity policy of the university will be helped by the fact that most of the lectures are taught using these remote teaching tools (and the unforeseen disruptions will be minimized); clearly, during inclement weather students don't need to be travelling to 640 Mass Ave since the lecture will be taught using remote teaching tools.

Texts and other media required (placed on reserve at Georgetown University Library)

- Jerry Kaplan, Artificial Intelligence-What everybody needs to know, Oxford University Press, 2016,
 - ISBN ISBN 978-0-190-60239-0
- Max More and Natasha Vita-More Editors, The Transhumanism Reader, 2013
 - Wiley Blackwell, a John Wiley & Sons Publishing
 - ISBN 978-1-118-33431-7
- R. Kurzweil, The Singularity is Near, Penguin Books, 2005,
 - ISBN 0 14 30.3788 9
- Eric Drexler, Engines of Creation: 1989, The Coming Era of Nanotechnology (available on line:
http://e-drexler.com/d/06/00/EOC/EOC_Table_of_Contents.html)
- Francis Fukuyama, Our Post Human Future, 2002, Farrar, Straus and Giroux Publishing, New York,
 - ISBN 0-374-23643-7
- N. Bostrom, Superintelligence, I.E.G.O. SpA, 2014, ISBN: 978-0199678112, (available also on Kindle); available at Georgetown University library as electronic resource ([http://catalog.library.georgetown.edu/search/X?SEARCH=a:\(nick%20bostrom\)&searchscope=4&SORT=D](http://catalog.library.georgetown.edu/search/X?SEARCH=a:(nick%20bostrom)&searchscope=4&SORT=D))
- Media:
 - Gattaca (director: Andrew Niccol): movie released by Columbia Pictures, 1997
 - The Singularity (director: Doug Wolens); documentary movie
 - The Matrix: movie released by Warner Bros, 1999, directed by The Wachowski Brothers

Texts (not required but recommended)

- Rolf Pfeifer & Christian Scheier, *Understanding Intelligence*, The MIT Press, 1999
 - ISBN: 0-262-16181-8
- Charles Rubin, *The Eclipse of Man*, New Atlantis Books, 2014,
 - ISBN: 978-1-59403-736-8
- Eric Drexler, *Radical Abundance*, 2013, Perseus Book Group
ISBN-13: 978-1610391139
- John Horgan, *The End of Science*, Addison-Wesley Publishing Company, 1996,
 - ISBN 0-201-62679-9
- * C. Grau, *Philosophers Explore Matrix*, 2005, Oxford University Press,
 - * ISBN-13: 978-0195181074
- Glenn Yeffeth Editor , *Taking the Red Pill* , Benbella Book, 2002,
 - ISBN – 1-932100-02-4

Primary Sources - required (they will be provided weekly in the class packet)

- Nick Bostrom, *Transhumanism Values* (in the packet)
- S. Dickel & A. Frewer, *Life Extension- Eternal Debates on Immortality* (in the packet), in *Post and TransHumaniasm*
- Robert Geraci-*Apocalyptic AI*, Oxford University Press, 2010 (in the packet)
- Robert Ranisch, *Transhumanism Morality* (in the packet) in *Post and TransHumaniasm*
- *Phs-Explore-Matrix-Chii-Kevin-Warwick* (in the packet)
- David S. Oderberg, *Could There Be a Superhuman Species* (in the packet)
- Holub-*Creating-Better-People* (in the packet)
- Patrick D. Hopkins, *Why Uploading will not Work, or, The Ghost Haunting Transhumanism* (in the packet)
- Michael Hauskeller, *My Brain, My Mind, and I: Some Philosophical Assumptions of Mind-Uploading* (in the packet)
- Anthony Rhodes, *The Case Against Computational Theory of the Mind: A Refutation of Mathematically- Contingent Weak A.I.* (in the packet)

Course Outline

Week1: Introductions and orientation; goals of the course and review of the syllabus
AI: what it is, where is coming from, ubiquitous presence today,
General goals of Humanism, transhumanism, posthumanism;
- dependence on major technical and scientific advances

- traditional areas of philosophy (ethics, theory of knowledge)
- relationship to religion

Watch the documentary: The Singularity (director Doug Wolens)

Week2: AI – a quick historical review

- AI is everywhere around us (great successes in the last two decades)
- The task of defining AI (not an easy one)
- Birth and first two decades of success
- The beginning of hype: “thinking computers; soon better than people”
- AI winter: the danger of ignoring philosophers

Week3: The revival of AI: Machine learning (ML)

- Symbolism, expert systems: raise and fall of GOFAI
- The story of the perceptron
- How is ML working; how is it different from GOFAI
- Why is ML so successful

Week4:

Singularity and other core technologies

- Singularity concept
- Technological Singularity. The overlapping of three major revolutions GNR(genetics, nanotechnology, robotics).
- The law of accelerated returns; Benefits and potential contributions of GNR to achieving transhumanism’s goals
- Nano everything, personal identity, enhanced decision making (proactionary principle)

Week5:

Nano technology;

- historical developments
- Drexel and visions of molecular factories: molecular assemblers, replicators,
- nano medicine, nanobots,
- nano technology and existential threats (Bill Joy and the “gray goo” problem)

Week6:

Human enhancement – visions of transhumanism and posthumanism

- five areas of human enhancement and potential social implications
- life expansion and immortalism (Land of Cockaigne)
- physical enhancement; social and self-esteem implications

Week7:

Bio-determinism and its social and ethical implications

- genetic engineering, germline therapy (CRSPR-Cas9)
- the optimistic transhumanism view (R. Bailey)

- the pessimistic view (transhumanists' critics)
- concept of human nature, human rights, human dignity and implications of ignoring (or negating) it
- Fukuyama and the call for regulatory policies

Watch the movie: Gattaca (director Andrew Niccol), 1997

Week8:

Artificial Superintelligence (ASI);
the paths to achieve ASI (whole brain emulation, biological cognition, etc.)
Cognitive superpowers (an ASI takeover scenario)

Week9:

ASI, the intelligence explosion; existential threats; the control problem
Discussion of the Fermi paradox
Substrate independent mind uploading (SIMU)
Living in a simulation?
Religious implications of the concepts of Transhumanism and of "living in a simulated world (software angels)

Watch the movie: The Matrix (director The Wachowski Brothers), 1999

Week10:

Critiques and alternative points of view to Transhumanism.
-"Singularity is not near"; challenges to the timeline and
- other technology assumptions
- Issues with the law of accelerated returns
- Complexity break and implications for software developments
- The "mind-body" problem; challenges to the concept of conscious machines

Week11:

Nano technology; conceptual and implementation issues
The Drexler-Smalley debate
Nano technology and atomically precise manufacturing (APM)

Week12:

General Critiques of transhumanism
- future hype, hubris, designer babies, trivialization of human identity,
- Gattaca argument, eugenic wars, Brave New World (BNW) argument

Week13:

Metaphysical issues as potential show stoppers for transhumanism's goals:
- achieving consciousness in artificial intelligence - lack of consensus about CTM (computational theory of mind)
- embodied and situated AI; an alternative paradigm to computationalism

- mind uploading;
 - o whole brain emulation is not achievable,
 - o mind is biological substrate dependent
 - o personal identity issues

Week14: Wrap-up and Concluding Thoughts
Final Exam due date to be announced