Spring 2019

HSS 408-461: Robots + Work

Bernadette Longo

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HSS 408, Robots + Work  
Dr. Bernadette Longo, Spring 2019

Section 461: online via Moodle (http://moodle.njit.edu) 
Instructor Office: Cullimore Hall 419 
Office Hours: Tuesdays 11:00 a.m.– 12:30 p.m. and by appt. 
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E-mail: blongo@njit.edu

Course Description: Humanities senior seminar. Combine current theory with practice to prepare students as socially conscious technology developers. Analyze complex social and technical situations to develop socially appropriate responses through tasks that involve problem analysis, ethical considerations, and technology issues regarding “influences on the distribution of jobs and nature of work. While advances promise to inject great value into the economy, they can also be the source of disruptions as new kinds of work are create and other types of work become less needed due to automation” (Partnership on AI).

Open questions we will explore include (from DeepMind Ethics & Society):

- How can we understand and estimate the effect AI will have on the changing labor market? What are the possible risks, benefits, and consequences of these changes?
- How and when will AI affect the relative earning power of different economic groups in society? What forms of inequality could this create or exacerbate?
- How can the social and economic impact of AI be anticipated and modelled, given that they are predicated on technological advances yet to be made?
- What new opportunities do these technologies create, and what responses are needed to ensure positive economic effects, inclusivity and equal access to benefits?

Learning Objectives
1. Be familiar with historical ideas relating to automation and impacts on labor markets. Be able to relate historical information with current and future trends in technology development and its social implications.  
2. Be familiar with effects of automation and robotics on current labor markets and business practices. Analyze effects and apply them to future trends in technology development and its social implications.
3. Analyze and effects of trends in automation, robotics, and business practices on conditions of various economic groups in society. Apply analysis to specific cases and their social implications.
4. Analyze ethical issues relating to trends in automation, robotics, and business practices. Apply analysis to specific cases and their social implications.
5. Write effective prose that is professionally appropriate and mechanically correct.
Course Materials


Additional resources available on Moodle course site.

- AI Now 2016 Symposium at NYU and 2017 Symposium at MIT.
- Rossum’s Universal Robots (R.U.R.) audiobook at this link. This 1920 science fiction play introduced the term “robot” into our lexicon. This play by Czech writer Karel Capek also sets out an archetypal plot for human-machine relations that continues to impact and reflect our relations with intelligent machines. The language in this play may seem dated, but it’s worth listening to this early dramatization of a foundational plot.

Academic Integrity: “Academic Integrity is the cornerstone of higher education and is central to the ideals of this course and the university. Cheating is strictly prohibited and devalues the degree that you are working on. As a member of the NJIT community, it is your responsibility to protect your educational investment by knowing and following the academic code of integrity policy that is found at: http://www5.njit.edu/policies/sites/policies/files/academic-integrity-code.pdf. Please note that it is my professional obligation and responsibility to report any academic misconduct to the Dean of Students Office. Any student found in violation of the code by cheating, plagiarizing or using any online software inappropriately will result in disciplinary action. This may include a failing grade of F, and/or suspension or
**dismissal from the university.** If you have any questions about the code of Academic Integrity, please contact the Dean of Students Office at dos@njit.edu.

**Students with disabilities:** Appropriate accommodations will be made for all students with documented disabilities. If you have a disability requiring accommodation in this class, please notify me as soon as possible. This information will be kept confidential. For more information, see http://www.njit.edu/studentsuccess/disability-support-services-0/.

**Grading:** Your assignment grades will be given in points. Ten percent of the maximum assignment grade will be deducted each day that an assignment is not posted after an assignment deadline. The maximum number of points possible in the course is 1000. Your final course grades will be assigned according to the following scale:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Point totals</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>901-1000</td>
<td>Superior</td>
</tr>
<tr>
<td>B+</td>
<td>867-900</td>
<td>Excellent</td>
</tr>
<tr>
<td>B</td>
<td>801-866</td>
<td>Very Good</td>
</tr>
<tr>
<td>C+</td>
<td>767-800</td>
<td>Good</td>
</tr>
<tr>
<td>C</td>
<td>701-766</td>
<td>Acceptable</td>
</tr>
<tr>
<td>D</td>
<td>601-700</td>
<td>Minimum</td>
</tr>
<tr>
<td>F</td>
<td>000-600</td>
<td>Inadequate</td>
</tr>
</tbody>
</table>

Incomplete coursework is a major inconvenience for students and instructors. I expect you to do everything in your power to avoid this situation. Legitimate excuses include verified illnesses and family emergencies. No incompletes will be given unless you have a prior written agreement with me. If you have questions about the NJIT grading policy, please click here. If you have questions about your responsibilities for course requirements, please click here.

**Assignments**
- Week 1A + 1B ................................................................................................................... 40 pts.
- Week 2 .............................................................................................................................. 45 pts.
- Week 3 .............................................................................................................................. 50 pts.
- Week 4 .............................................................................................................................. 50 pts.
- Week 5 .............................................................................................................................. 50 pts.
- Week 6 .............................................................................................................................. 55 pts.
- Week 7 .............................................................................................................................. 50 pts.
- Week 8 .............................................................................................................................. 100 pts.
- Week 9A + 9B .................................................................................................................... 80 pts.
- Week 10 ............................................................................................................................ 50 pts.
- Week 11 ............................................................................................................................ 70 pts.
- Week 13 ............................................................................................................................ 30 pts.
- Week 14 ............................................................................................................................ 200 pts.
- Week 15 ............................................................................................................................ 130 pts.

Total points possible 1000 points
HSS 408 Class Activities

Week 1: January 22-27

Topic: Impacts of Automation on Employment

Reading:

Assignment 1: post by Sunday, January 27 at midnight
- **1A:** Post an introduction of yourself for the others in class to get to know you. Use your creativity regarding media and types of documents you use in your introduction. Answer the following questions and add what you will:
  - Your name and major
  - Your goals for work in this senior seminar
- **1B:** Post your initial thoughts on one or more of these open questions from DeepMind that we will be exploring this semester. There will be discussion boards available for each question on the course site.
  - How can we understand and estimate the effect AI will have on the changing labor market? What are the possible risks, benefits, and consequences of these changes?
  - How and when will AI affect the relative earning power of different economic groups in society? What forms of inequality could this create or exacerbate?
  - How can the social and economic impact of AI be anticipated and modelled, given that they are predicated on technological advances yet to be made?
  - What new opportunities do these technologies create, and what responses are needed to ensure positive economic effects, inclusivity and equal access to benefits?

Week 2: January 28-February 3

Topic: Impacts of Automation on Society

Reading:
• Schwab, Klaus. “Chapter 3.4: Society” and “3.5 The Individual” The Fourth Industrial Revolution. Pages 91-105.

Assignment 2: post by Sunday, February 3 at midnight
• Post your responses to these questions:
  2.1 Are some jobs too important, or too dangerous, for machines to take over?
  2.2 What ethical implications do you see in this statement from the Bekey reading: “It is evident that shared, cooperative work between humans and robots may enhance the working environment, but it may also reduce human-human interaction and communication.”
  2.3 How do you respond to this statement from the Schwab reading: “When one’s life becomes fully transparent and when indiscretions big or small become knowable to all, who will have the courage to assume top leadership responsibilities?”

Week 3: February 4-10
Topic: Changing Labor Market
Reading:
• McKinsey Global Institute. “What is the future of work?” December 2017. Podcast and transcript online at this link.

Assignment 3: post by Sunday, February 10 at midnight
• Post your response to this Open Question 1:
  o How can we understand and estimate the effect AI will have on the changing labor market? What are the possible risks, benefits, and consequences of these changes?

Week 4: February 11 - 17
Topic: Economies Around the World
Reading:

Assignment 4: post by Sunday, February 17 at midnight
• Post your response to this statement from the Ross reading:
  o “The growing economic diversity and increasing pace of change means that investors and people in global business will have to be as mobile and able to work across cultures as people newly entering the workforce.”
Week 5: February 18-24
Topic: Earning Power of Economic Groups
Reading:
- McKinsey Global Institute. “Jobs Lost, jobs gained: What the future of work will mean for jobs, skills, and wages.” December 2017. Article and full report available online at this link.

Assignment 5: post by Sunday, February 24 at midnight
- Post your response to this Open Question 2:
  - How and when will AI affect the relative earning power of different economic groups in society? What forms of inequality could this create or exacerbate?

Week 6: February 25-March 3
Topic: Anticipating Economic Impacts
Reading:

Assignment 6: post by Sunday, March 3 at midnight
- Post your response to this question:
  - On page 3 of the December 20, 2016 White House report, the authors say, “Technology is not destiny; economic incentives and public policy can play a significant role in shaping the direction and effects of technological change. Given appropriate attention and the right policy and institutional responses, advanced automation can be compatible with productivity, high levels of employment, and more broadly shared prosperity.” They then present three policy strategies for anticipating economic impacts of AI. What are your reactions to these policy statements?

Week 7: March 4-10
Topic: Modeling the Future
Reading:
- PWC. “The macroeconomic impact of artificial intelligence.” Online at this link. Full report posted on course site.
Assignment 7: post by Sunday, March 10 at midnight
• Post your response to this Open Question 3:
  o How can the social and economic impact of AI be anticipated and modelled, given that they are predicated on technological advances yet to be made?

Week 8: March 11 - 17
Topic: Position Paper Midterm
Reading:
• Model UN Preparation. “Position Papers.” Online at this link.

Assignment 8: post by Sunday, March 17 at midnight

Using the readings in Weeks 1-7, write a position paper on what you’ve learned about the topic of Robots + Work so far this semester. Structure your paper around these open questions (from DeepMind Ethics & Society):

• How can we understand and estimate the effect AI will have on the changing labor market? What are the possible risks, benefits, and consequences of these changes?
• How and when will AI affect the relative earning power of different economic groups in society? What forms of inequality could this create or exacerbate?
• How can the social and economic impact of AI be anticipated and modelled, given that they are predicated on technological advances yet to be made?

Your audience will be Dr. Longo and the other students in class this semester. Your purpose is to demonstrate what you have learned about the topic and how you can apply your knowledge outside the classroom to society-at-large as a technology professional.

Week 9: March 18-24
Enjoy the Spring Break!

Week 10: March 25-31
Topic: Social Responsibility and Collaborative Writing
Reading:
• Your partner’s Week 8 position paper.

Assignment 10: post by Sunday, March 31 at midnight
• As a team, complete the following and turn in 1 assignment for your team: 9A: Read each other’s position paper and write a comparison of each of your positions on Open Questions 1-3. How might you reconcile your positions into a team position on these questions?
**9B: Write your team’s reaction** to this statement from this week’s reading: “Technology is not neutral,” said Professor Sahami, who formerly worked at Google as a senior research scientist. “The choices that get made in building technology then have social ramifications.

**Week 11: April 1-7**
**Topic: Opportunities and Responses**
- Assignment 11: post by **Sunday, April 7** at midnight
  - As a team, post your response to this Open Question 4:
    - What new opportunities do these technologies create, and what responses are needed to ensure positive economic effects, inclusivity and equal access to benefits?

**Week 12: April 8-14**
**Topic: Opportunities and Responses Position Paper**
**Reading:**
- Model UN Preparation. “Position Papers.” Online at this link.
- Assignment 12: post by **Sunday, April 14** at midnight
  - Post your team’s position paper on Open Question 4:
    - What new opportunities do these technologies create, and what responses are needed to ensure positive economic effects, inclusivity and equal access to benefits?

**Week 13: April 15-21**
**Topic: Position Paper Draft**
**Reading:**
- Model UN Preparation. “Position Papers.” Online at this link.
- Assignment 13: post by **Sunday, April 21** at midnight
  - As a team and using the readings in Weeks 1-11, post a draft position paper on what your team has learned about the topic of Robots + Work this semester. Structure your paper around these open questions (from DeepMind Ethics & Society):
    - How can we understand and estimate the effect AI will have on the changing labor market? What are the possible risks, benefits, and consequences of these changes?
    - How and when will AI affect the relative earning power of different economic groups in society? What forms of inequality could this create or exacerbate?
    - How can the social and economic impact of AI be anticipated and modelled, given that they are predicated on technological advances yet to be made?
• What new opportunities do these technologies create, and what responses are needed to ensure positive economic effects, inclusivity and equal access to benefits?

Your audience will be the people working at AI Now Institute at New York University, Dr. Longo, and the other students in class this semester. Your purpose is to persuasively advocate for your team’s position based on what you have learned about the topic. The point of this assignment is to practice applying your knowledge as a technology professional to technology+society issues outside the classroom.

Week 14: April 22 - 28
Topic: Position Paper
Assignment 14: post by Sunday, April 28 at midnight
• As a team, revise your position paper into a final version.

Week 15: April 29-May 5
Topic: Final Analysis of Robots+Work
Assignment 15: post by Sunday, May 5 at midnight
o As an individual, post an analysis of the course topic “Robots+Work” covering the following points:
  1. What is your historical understanding of how robots have been incorporated into workplaces? Why is this understanding important for your position on the course topic?
  2. What is your understanding of the current situation regarding robots in workplaces? How did you come to this understanding? Why is this understanding important for your position on the course topic?
  3. What is your understanding of ethical questions regarding robots in workplaces? How did you come to this understanding? Why is this understanding important for your position on the course topic?
  4. What is your understanding of social implications regarding robots in workplaces? How did you come to this understanding? Why is this understanding important for your position on the course topic?
  5. What is your understanding of your social responsibility as a technology professional regarding robots in workplaces? How did you come to this understanding? Why is this understanding important for your career? Why is this understanding important for society-at-large?
  6. What is the main thing you learned this semester about Robots+Work? Why is this important and how might you use this experience in the future?

This syllabus and the due date schedule may be revised by the instructor at any time during the semester. All revisions will be reasonable and based on class needs.