

SOCIO-TECHNOLOGICAL EVOLUTION

Overview

There is an argument that says that technology shapes the way we live. There is also a counter-argument that says that we are full control of technology and that we can determine what to do with it, instead of the other way around. Viewed from a long-term perspective, however, it is clear that society and technology co-evolve over time. This course starts from the premise of co-evolution and asks the questions: what characterizes this co-evolution? What does it mean when we state that society and technology co-evolve? What is the role of politics and governance in this co-evolution?

We will engage in the scientific debate regarding technological determinism and governance. We will also pay ample attention to the emergence and properties of evolutionary theories in the social sciences, in particular in relation to complex systems. We will cover a wide range of literature, including some from theoretical biology, evolutionary economics and social theory. Naturally, all theoretical ideas will be illustrated with real-world examples of governance of technological systems. This interdisciplinary course is in particular interesting to curious students who are open-minded and eager to learn how other disciplines can inform political science.

Learning goals:

- To describe the relationship between technology and society in terms of co-evolving systems
- To obtain an overview of the pressing issues in evolutionary theories for the social sciences
- To make a reasoned stance in the technology debate
- To identify the main challenges of governing technological systems

Literature (mandatory):

E-reader, available online through Virtual Campus. See the reading guide below for a detailed table of contents.

Test and grading:

Students must pass a written test. This will be an open-book exam.

Registration:

Registration will be done during the first session.

Speaking hours:

Thursday, 02:00-03:00 p.m.

Mail: lasse.gerrits@uni-bamberg.de

Note: The seminar will be taught in English.

DETAILED PROGRAM AND READING GUIDE

April 16th: Introduction

This is the introductory session. We will talk about the content and goals of this lecture series and why the topics of this series matter in today's world. In addition, we will also discuss the administrative details of the program, including planning, assignment, and grading.

Learning goals:

- To get an overview of the this seminar series

Literature for this session:

- None.

April 23rd: What evolution?

Today's session focuses on the question: what is evolution? We will look at the history of the concept, the reasons for its popularity and why it matters to the social sciences. We will pay ample attention to the ways in which the concept has been transferred from biology into the social sciences but will also discuss the extent to which Darwin was in fact inspired by social theories of societal change.

Learning goals:

- To obtain an overview of the origins and development of the concept of evolution
- To explain why evolutionary theories matter in the social sciences.

Literature for this session:

- Sanderson, S. (1992). Evolutionary biology and social evolutionism. In: *Social Evolutionism, a critical history*. Oxford: Blackwell
- Sanderson, S. (1992). The nature of social evolutionism. In: *Social Evolutionism, a critical history*. Oxford: Blackwell
- Ghiselin, M. (2009). Darwin and the evolutionary foundations of society. *Journal of Economic Behavior and Organization* 71(1), 4-9
- Gopnik, A. (2014). The evolution catechism. *New Yorker*, 19 February 2015, can be found here: <http://www.newyorker.com/news/daily-comment/evolution-catechism>

April 30th: Social evolution

This session builds on the previous one and will take a much closer look on the adaptation of evolutionary theories to the social sciences in order to understand the ways in which societies develop. The history of these attempts shows periods of great enthusiasm punctuated by periods of critical reflection and denouncement of core concepts. We will discuss the arguments in support and against thinking of social change in terms of evolution and will develop the argument that, ultimately, one needs evolutionary thinking if one would like to comprehend societal change (or lack thereof).

Learning goals:

- To argue in favor and against the use of evolutionary theories in understanding social change.

Literature for this session:

- Sanderson, S. (1992). Classic evolutionism. In: *Social Evolutionism, a critical history*. Oxford: Blackwell
- Sanderson, S. (1992). The anti-revolutionary reaction. In: *Social Evolutionism, a critical history*. Oxford: Blackwell

May 7th: Teleology

A central theme in evolutionary theories is whether processes of societal change have a purpose and can be directed towards purpose. This is especially important in our little corner of the world as humans are seemingly able to purposefully influence their environment to suit their own need. This implies that social evolution can be directed. Teleology is the debate about the emergence of purpose and the extent to which we can assign that purpose to human agency. Do we create technologies that have a purpose or does purpose derive from technologies?

Learning goals:

- To give a reasoned view on whether social evolution features a purpose.

Literature for this session:

- Hodgson, G. M., & Knudsen, T. (2006). Dismantling Lamarckism: Why Descriptions of Socio-economic Evolution as Lamarckian are Misleading. *Journal of Evolutionary Economics* 16(4), 343-366.
- Ruse, M. (2000). Teleology: Yesterday, Today, and Tomorrow? *Studies in History and Philosophy of Science Part C: Studies in History and Philosophy of Biological and Biomedical Sciences* 31(1), 213-232
- Nelson, R. (2006). Perspectives on technological evolution. In: Dopfer, K. (eds) *The Evolutionary Foundation of Economics*. Cambridge: Cambridge University Press

May 16th: Progress and time

Please note that this session is on Saturday

The main question of today's session is: does social evolution lead to progress? Are we, as humans, able to create a better world? Are we able develop and use technologies to that particular end? But what constitutes a better world? And if so, to whom then? Is society as a whole on a path towards improvement or now? How do you know? We will discuss these issues during this meeting.

Learning goals:

- To give a reasoned view on whether evolution leads to societal progress

Literature this session:

- Norgaard, R. (1994). The illusion of progress. In: *Development Betrayed: the end of progress and a coevolutionary revisioning of the future*. London etc.: Routledge
- Tripsas, M. (1997). Unraveling the process of creative destruction: complementary assets and incumbent survival in the typesetter industry. *Strategic Management Journal*, 18, 119-142 \
- Appleyard, B. (2014). Why futurologists are always wrong – and why we should be sceptical of techno-utopians. *New Statesman*, April 10th, 2014, can be found here:

<http://www.newstatesman.com/culture/2014/04/why-futurologists-are-always-wrong-and-why-we-should-be-sceptical-techno-utopians>

May 21st: Metaphor or mechanism?

This session focuses on the question whether social evolution is in fact a metaphor or a mechanism. Some argue that evolutionary mechanisms are real and observable in social reality. Others take on a more constructivist view that accepts evolution as a useful metaphor to describe social reality. If evolution is a mechanism, then what exactly is being selected? What would constitute variation or retention? If evolution is a metaphor, then what exactly does it help us understanding?

Learning goals:

- To determine whether social evolution concerns a set of concrete mechanisms or a useful metaphor for social change

Literature this session:

- Elster, J. (2007). Mechanisms. In: Explaining Social Behavior: more nuts and bolts for the social sciences. Cambridge: Cambridge University Press.
- Ruse, M. (1999). Is evolution a social construction? *Endeavour* 22(4), 140–142

May 28th: Coevolution

We will examine the concept of coevolution in this session, in particular the coevolution between social, biological and technological systems. Coevolution points to the fact that variation, selection and retention are reciprocal. In other words: a species doesn't only adapt to its environment, the environment also adapt to the species. This kind of thinking has been proven to be very useful in understanding how societies deploy technology to create better circumstances (e.g. improved food production) and how this use of very same technology can lead to a deterioration of those circumstances (e.g. lack of food). Coevolution explains such reciprocal changes.

Learning goals

- To understand the concept of coevolution as an explanation for societal issues

Literature this session:

- Norgaard, R. (1994). A coevolutionary environmental history. In: *Development Betrayed: the end of progress and a coevolutionary revisioning of the future*. London etc.: Routledge
- Norgaard, R. (1994). Coevolutionary lessons from the Amazon. In: *Development Betrayed: the end of progress and a coevolutionary revisioning of the future*. London etc.: Routledge

June 6th: Evolution and economics

Please note that this session is on Saturday

Evolution has taken a strong position in economics, where it has increasingly become established as a powerful explanation for the fact that economic systems can't maintain stable equilibriums in the long run. We will focus on how evolutionary economics question the assumptions upon which mainstream economics are build, such as stability and progress. Next, we will take a critical look at the implications this view has on the ways in which we attempt to govern economic systems. Of course, we will do this by looking at cases of technology development.

Learning goals:

- To argue for the case of evolutionary economics

- To use evolutionary economics to analyze the state of economic systems

Literature this session:

- Nelson, R. and Winter, S. (1982). The need for an evolutionary theory. In: *An Evolutionary Theory of Economic Change*. Cambridge, MA: Harvard University Press
- Nelson, R. and Winter, S. (1982). Normative economics from an evolutionary perspective. In: *An Evolutionary Theory of Economic Change*. Cambridge, MA: Harvard University Press
- Hodgson, G. (2006). Decomposition and growth: biological metaphors in economics from the 1880s to the 1990s. In: Dopfer, K. (eds) *The Evolutionary Foundation of Economics*. Cambridge: Cambridge University Press

June 11th: no session

June 18th: no session

June 25th: Evolution and the city

One particular part of society where the co-evolution of mankind and technology is in particular visible is the city. We have built cities in response to environmental pressures: to have a safe place to stay, to have access to food and other necessities, to be able to work and earn a living. But the city has also created us: we need technologies to survive in cities and these technologies shape our behavioral patterns. We will therefore take a closer look at how cities evolve through our own decisions and actions and how this evolution, in turn, affects us in the ways in which we use the city.

Learning goals:

- To explain the patterns of reciprocal selection between cities as human settlements and human behavior.

Literature this session:

- Marshall, S. (2009). Cities in evolution. In: *Cities, design and evolution*. London etc.: Routledge
- Marshall, S. (2009). Planning, design and evolution. In: *Cities, design and evolution*. London etc.: Routledge

July 2nd: Connected technologies

So far in this series, we have assumed that technologies are connected to other technologies, and that those technologies are connected to humans, too. This point generally accepted but some, in particular those who have developed Actor-Network Theory (ANT), argue that we can and should obtain a much better understanding of that connection. How, exactly, are we connected? Are we all connected or not? And what are the implications of such connectedness. This session will focus on these questions.

Learning goals:

- To explain the properties of socio-technical connectedness

Literature this session:

- Law, J. (1992). Notes on the Theory of the Actor-Network: Ordering, Strategy, and Heterogeneity. *Systems Practice*, 5(4) 379-393

- Geels, F. (2002). Technological transitions as evolutionary reconfiguration processes: a multi-level perspective and a case-study. *Research Policy* 31(8-9), 1257-1274

July 9th: You and me

We will look into the position of the individual in socio-technological evolution. Individuals find themselves in a position where selection pressures bring about uncertainty. Naturally, people look for ways to deal with that uncertainty. In doing so, they engage in social interaction, cooperation or lack thereof. Such actions bring about selection pressures to others. We will look into some of the basic mechanisms of human behavior and how those mechanisms bring about social structures that evolve over time.

Learning goals:

- To identify some of the basic mechanisms of human behavior
- To explain how those mechanisms lead to social structures

Literature for this session

- Simon, H. (2006). Darwinism, altruism and economics. In: Dopfer, K. (eds) *The Evolutionary Foundation of Economics*. Cambridge: Cambridge University Press
- Alchian, A. (1950). Uncertainty, evolution and economic theory. *The Journal of Political Economy*, 58(3) 211-221
- Forber, P., and Smead, R. (2015). Evolution and the classification of social behavior. Evolution and the classification of social behavior. *Biology and Philosophy*, DOI 10.1007/s10539-015-9486

July 16th: Case studies

At the end of this lecture series, we will take a closer look at some empirical examples of socio-technological evolutions. We will discuss the characteristics of these cases and what they mean for the governance of such evolutionary processes.

Learning goals:

- To make a reasoned argument for certain governance approaches.

Literature this session:

- Frenken, K. (2014). The evolution of the Dutch dairy industry and the rise of cooperatives: a research note. *Journal of Institutional Economics*, 10(1) 163 - 174
- Frenken, K. (2000). A complexity approach to innovation networks. The case of the aircraft industry. *Research Policy* 29, 257-272

July 23rd: Concluding session

This session is meant to deal with the remaining issues that still need to be addressed.