

Law and the Brain

Tulane University Law School
4LAW 4210

Administrative Memo & Syllabus

Professor Francis X. Shen

Fall 2011

Location: Room 302

Wednesdays, 10:00 am – 12:00 pm

What are adolescents, psychopaths, and white-collar fraud artists thinking? Why does emotional trauma for victims of abuse last so long? Why is eye-witness memory so poor? How can you get into the heads of the judge and jury? Questions like these are asked all the time by lawyers, and increasingly brain science is providing legally useful answers. U.S. courts, including the U.S. Supreme Court, are already integrating neuroscience research into opinions. This Law and the Brain seminar will introduce the exciting new field of “neurolaw” by covering issues such as the neuroscience of criminal culpability, brain-based lie detection, memory enhancement, emotions, decision making, and much more. Along the way we’ll discuss how the legal system can and should respond to new insights on topics such as adolescent brain development, addiction, psychopathy, Alzheimer’s, the effects of combat on soldiers’ brains, and concussions from sports injuries. (Note that all scientific material in the seminar will be presented in an accessible manner, so no previous science background is required.)

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- Office: Weinmann Hall, 206C
Office Hours: Wednesdays, 1:00 – 3:00 pm (Drop In) + By Appointment
- Required Text: OWEN D. JONES, JEFFREY D. SCHALL & FRANCIS X. SHEN, *LAW AND NEUROSCIENCE: CASES AND MATERIALS ON NEUROLAW* (Forthcoming, Aspen Publishers). Note: Electronic and print copies of a draft version of the book will be distributed.

<http://www.psy.vanderbilt.edu/courses/neurolaw/students/>
[user name and password will be announced separately]
- Suggested Reference Text: JAMIE WARD, *THE STUDENT’S GUIDE TO COGNITIVE NEUROSCIENCE* (2nd Ed.) (2009). Online: <http://www.psypress.com/ward/>
- Grading: See Section V below. No pass/fail. Final paper of 25-30 pages. Attendance and completion of all seminar tasks is required.

I. Law and Neuroscience ¹

Brain science has become a part of our lives in many ways. Parents make decisions about altering their child's brain chemistry through drug treatments for attention deficit disorder. Children grapple with the aging brains of their parents when cases of Alzheimer's and dementia arise. Schools and coaches think about the impact of brain trauma on the sports field, and the military thinks about the impact of combat on the brains of soldiers. Billions of dollars of research are spent to better understand addiction, control impulsive behavior, and improve cognitive performance.

The legal system too is starting to see more brain science in its midst. The integration of neuroscience and law ("neurolaw") is a hot topic in legal and neuroscientific circles. In the popular press, the *New York Times Magazine* ran a cover story on neuroscience and law; "neuroscience in court" was named – by the preeminent scientific journal *Science* – as one of the top seven topics to watch in 2008; and the MacArthur Foundation invested \$10,000,000 to support a *Law and Neuroscience Project* to spur research at this intersection. In the courtroom, although the absolute number of neurolaw cases remains small, the data suggest we are in a period of exponential growth. For example, there were roughly 4 times as many cases in 2009 as in 2006. In legal scholarship, too, interest is rapidly increasing. There are now over 600 entries in the Law and Neuroscience Bibliography, with most entries published in the past few years.

The future of law and neuroscience remains unknown, and at present the field is just in its infancy. As you'll see from this syllabus, law and neuroscience has the potential to encompass many things. Most importantly for you, neurolaw is an area of law that is still uncharted territory – ripe for exploration by young, intrepid legal thinkers!

II. Seminar Aims and Objectives:

Aims. This seminar has two interrelated aims: (1) to introduce you to the most important questions emerging from the intersection of law and neuroscience; and (2) to help you harness brain research to become a better practicing attorney. If you complete this seminar, you will be exposed to path-breaking scientific research, learn how that research may (or may not) be applicable to legal questions, and learn more about how your own brain works (and can work better) as a legal actor.

Specific Learning Objectives. By the end of this seminar, you will:

- ✦ Learn a set of legally relevant "brain basics" – how the brain works, how researchers study it, and different types of brain measurement and monitoring devices.
- ✦ Gain exposure to the many ways in which neuroscience research is being deployed in legal contexts such as criminal proceedings, civil litigation, state and federal legislation, regulatory oversight, and policy evaluation.
- ✦ Think critically about whether, and under what conditions, neuroscientific evidence should be admitted in courtroom proceedings.

¹ A note on terminology: "Neuroscience", as I am using the term, is analogous to "brain sciences" or "study of the brain". The term neuroscience derives from the word "neuron" – which is the special type of cell that our brains rely on to function. The phrases "Law and Neuroscience", "Neuroscience and Law", and "Neurolaw" will be used interchangeably to refer to the application of neuroscience findings to law (broadly defined).

- ✦ Learn what questions to ask, and what further resources to consult, if and when you are confronted with neuroscience evidence in your practice.
- ✦ Develop a better understanding of how and why legal actors (including you) act and think, thereby allowing for refinement in your legal advocacy skills.
- ✦ Develop, through a short oral presentation in class, your skills in presenting complex material in a succinct, accessible and legally-relevant manner.
- ✦ Develop a deep, substantive understanding of a selected part of the neurolaw landscape through the development of a paper, roughly 25-30 pages in length, exploring in-depth a topic at the intersection of law and neuroscience.

III. Format, Procedures, & Seminar Philosophy

This is a seminar that allows for both breadth (in coverage of many important neurolaw topics) and depth (through your selection of particular paper topic). The centerpiece of our weekly two-hour meetings will be discussion of the week’s reading material, but I will also use some of class time to provide contextualizing background on the science involved.

It is important to emphasize that *no science background is required for this seminar*. For those students who have not cracked open a science book since high school, or those who label themselves as “not a science person” I encourage you not to rule out the seminar. Indeed, you may find that learning about basic brain science (in this legally meaningful context) isn’t as hard as you imagine it to be.

For those students who do have a science background, you will have many opportunities – especially through the choice of your paper topic –to navigate the seminar in a manner that is consistent with your scientific literacy. For instance, as you’ll read below that there is an opportunity to design a research experiment as a part of your final paper.

In sum, regardless of your scientific background, I am confident that you can find many meaningful ways to engage with the seminar material.

While the paper and paper-related assignments will comprise the majority of your grade, you will also be making brief (no more than 5 minute) oral presentations, on an assigned day, as part of an in-class debate series. The preliminary debate topics are discussed later in this document.

The seminar is built on two premises: (1) you will best learn about brain science by using it in legally relevant ways; and (2) the implications of neuroscience for law are open to much debate and criticism. Put these two pieces together, and we arrive at a seminar that should raise many challenging questions and provide active engagement with science and law.

The thirteen-week seminar is divided into three parts. Part One comprises the first two weeks, when you will be introduced (through several illustrative cases) to the ways in which neuroscience and law are already intersecting. In these first two weeks we’ll lay out the basic tensions in neurolaw and introduce some of the most basic brain terms you’ll encounter. You’ll start to think, in a preliminary way, about what questions you may want to pursue in your paper.

Part Two of the seminar, which will run nine weeks, will introduce the topics on which you are most likely to write your paper. These topics will include Admissibility of Neuroscientific Evidence; Memory and the Law; Brain-Based Lie Detection; Addiction; Emotion and Decision Making; and Mental Health. We will also discuss: the Adolescent Brain; the Victim's Brain; the Psychopath's Brain; the Veteran's Brain; the Athlete's Brain; and the Robot Brain. Across these topics we'll encounter a wealth of interesting case law, legislation, and public policy challenges. We will also encounter a lot of brain science, and I'll spend part of each class (preceding the reading) introducing and explaining what you need to know.

Part Three of the seminar, the final two weeks, is designed to accomplish two things: (1) introduce you to brain research that may make you a better practicing attorney; and (2) allow significant time for development of your research papers. Already there exist a number of Continuing Legal Education courses that integrate psychology and neuroscience research into skills training for negotiation and trial skills. We will review some of this material, focusing in particular on the many unconscious ways in which decisions are (sometimes sub-optimally) made. Across these final two weeks we will also save some class time for addressing common questions that arise in the development of your seminar papers.

IV. Seminar Requirements

1. *Class attendance and participation policy:* Class attendance and active participation both in class and through e-communication, is required. You are expected to attend seminar, complete all of the assignments noted below, and provide significant feedback to your colleagues.

2. *Seminar readings:* All seminar readings will be derived from the draft version of OWEN D. JONES, JEFFREY D. SCHALL & FRANCIS X. SHEN, *LAW AND NEUROSCIENCE: CASES AND MATERIALS ON NEUROLAW* (Forthcoming, Aspen Publishers). This text grows out of collaborative work in the MacArthur Foundation Law and Neuroscience Project at Vanderbilt University, and is based on three iterations of a "Law and Neuroscience" course taught previously at Vanderbilt. The book, scheduled to be in print in 2013, will be the first of its kind. Materials will be made available on-line and in hard copy.

All of the readings, as well as a wealth of additional electronic materials, will be made available on the book web site: <http://www.vanderbilt.edu/lawbrain>. A login and password, which will be provided to you, is required to access the course materials. The login and password are not to be distributed beyond registered students in the seminar.

3. *Assignments.* Each of the following assignments must be completed in order to pass the seminar:

- Submission of your preliminary research proposal and outline (minimum 3 pages) by Monday, October 3rd.
- Presentation, in class, of a mock Opening Argument in an assigned neurolaw case (guidelines for this assignment will be provided).
- Submission of your completed seminar paper (minimum 25 pages) by the first day of the Fall exam period (Monday, December 5th).

V. Grading

Basis for Grades. Grading will be comprised of the following components:

- 25%: Class participation
- 15%: Preparation and presentation of a mock “Opening Statement”
- 10%: Paper outline
- 50%: Final seminar paper

Class Participation (25%). This is a seminar in which active participation with classmates and meaningful engagement with seminar materials is expected. Class participation includes attendance, thorough preparation of reading and written assignments; scholarly, and constructive critique of readings; adherence to the cell phone and laptop policies discussed below; and avoidance of unexcused absences.

Mock Opening Statement (15%). Each student will be assigned one case for which they are to prepare a mock “Opening Statement”. The opening statement will last no more than 5 minutes, and will integrate (in whatever ways you see as most effective) the brain science relevant to the case. The opening statement will allow you to demonstrate your knowledge of both the legal and scientific issues in the case. You will be assigned to a case early in the semester, allowing ample time for preparation and professor feedback. Students will make the opening statement at the start of the assigned class session. More details will be provided about the opening statements in class.

Seminar Paper Outline (10%). By approximately midway through the semester (adjustable depending on individual circumstances) you will be required to submit to me a short outline for your seminar paper. I will review the outline, offering suggestions for how to further develop the paper. Note that the seminar paper must be primarily of an analytical rather than descriptive nature. I strongly recommend that no more than one-third of the paper be devoted to descriptive background.

In choosing your paper topic, I encourage you to speak with me outside of class. There are many interesting questions to ask in the field of neurolaw, and many creative ways to answer those questions. Your paper and your education benefit most when you write on a topic that particularly interests you. Consequently, you should develop your topic very carefully, so that it is something you will enjoy exploring. Experience suggests that a narrow topic explored in some depth makes for a better paper, and a more fulfilling experience, than a broad topic explored superficially.

Depending on your ambition, it’s possible that this seminar paper could serve as the basis for a Note. Given that this area of law remains such new territory, the paper you write for this seminar may very well be the first piece ever written on that particular question! For those students with the appropriate background and interests, there are also many opportunities for incorporating into your paper elements of empirical research design and even data collection. There is no expectation that you take this route, and incorporating data or an empirical research design does *not* necessarily lead to better papers. But should you wish to pursue this route, I am happy to discuss it.

Final seminar paper (50%). As is appropriate in a seminar, the bulk of your grade rests on the quality of your final seminar paper. Factors relevant to the grading of papers (in no particular order) are:

Depth of Research; Organization and Clarity; Thoroughness; Originality; Accuracy and Professionalism; Compliance with Directions; and Strict Compliance with Honor Code (including proscriptions against plagiarism). Many more details about the final paper will be provided in seminar.

Cell Phones, Smart Phones, and Laptops

Our two hours together each week will be cell phone and smart phone free. When you walk into the room, you are expected to turn off your phones. Exceptions will be made only in exceptional circumstances (which you should discuss with me before class). Student laptops in the classroom are a conundrum to many professors, and professors at some schools have experimented with banning them from classrooms altogether. I believe in harnessing the power of the Internet, and we will draw on interactive tasks even within seminar. However, you are expected to refrain from any computer use that is not germane to the seminar.² Violation of the laptop use policy will result in a reduced class participation grade.

VI. Academic Integrity

Each student in this seminar is expected to abide by the policies discussed in the Tulane University School of Law Code of Professionalism.³ In this seminar you are encouraged to study together and to discuss information and concepts covered in our weekly seminar discussions. With the exception of clearly noted collaborative tasks, this permissible cooperation should never involve a student submitting as her/his own work the work of another. If at any time you have questions about the right way to proceed, simply ask.

² For a good summary of the debate, and some “pro-laptop” data, see: Kristen E. Murray, *Let Them Use Laptops: Debunking the Assumptions Underlying the Debate Over Laptops in the Classroom*, 36 OKLA. CITY U. L. REV. 185 (Forthcoming, <http://ssrn.com/abstract=1761358>).

³ See: http://webdocs.registrar.fas.harvard.edu/ugrad_handbook/current/chapter2/academic_dishonesty.html

VII. Seminar Schedule

Part One

Week 1, 8/24/11. What is law and neuroscience?

- *Read before class:* Chapter 1 in LAW AND NEUROSCIENCE

Week 2, 8/31/11. Brains and Responsibility: The Case of Herbert Weinstein

- *Read before class:* Chapter 2 in LAW AND NEUROSCIENCE
- *Skim before class:* Pages 49-55 in THE STUDENT'S GUIDE TO COGNITIVE NEUROSCIENCE

The plan for this week's class: This Wednesday we will cover the case of *People v. Weinstein*. Our class will proceed roughly as follows: I. I will walk through a few minor administrative details, including the schedule for the opening arguments and some advice on how to approach the readings with an eye toward the paper you will be writing. II. I will then spend 15-20 minutes presenting some background (both scientific and criminal) relevant to our discussion. I'll provide some very basic brain terminology, as well as some of the most basic distinctions in thinking about the justifications for punishment in criminal law. (There are dedicated casebook chapters to both of these topics, but we won't have time to get to them in our 13 weeks). III. Having set the stage, we will then dig into the Weinstein case.

Part Two

Week 3, 9/7/11. Mind, Body, and Brain Death: Are We Just Our Brains?

- *Read before class:* Chapter 13 in LAW AND NEUROSCIENCE
- *Skim before class:* Assigned pages from Chapters 7 & 8 in LAW AND NEUROSCIENCE

Week 4, 9/14/11. Brain Science as Evidence: Promise and Caution

- *Read before class:* Chapter 14 in LAW AND NEUROSCIENCE
- *Skim before class:* Assigned pages from Chapter 12 in LAW AND NEUROSCIENCE

Please read these chapters in this way:

1. Read all of Chapter 14 (on Evidence) -- ~40 pages. As we discussed in class, read with an eye toward the fundamental tensions and unanswered questions. Think about what possible discussion questions might look like, and pay special attention to Frye and Daubert (and how you might apply them in different contexts). 2. In Chapter 12, read at least the Excerpt from Owen D. Jones et al., *Brain Imaging for Legal Thinkers: A Guide for the Perplexed*, 2009 STAN. TECH. L. REV. 5. (The excerpt is only a few pages). 3. If you have time, and especially if you are thinking about writing a paper that may touch upon issues related to brain imaging (and its potential legal relevance) skim the rest of Chapter 12. 4. For those interested in more detail, you will find these two resources quite helpful: 1) the full version of *Brain Imaging for Legal Thinkers* on the casebook web site (and at: <http://ssrn.com/abstract=1563612>). 2) a great article by Teneille Brown and Emily Murphy: *Through A Scanner Darkly* (on our web site, also at: <http://ssrn.com/abstract=1405371>)

Week 5, 9/21/11. Memory and the Law

- *Read before class:* Chapter 15 in LAW AND NEUROSCIENCE
- *Skim before class:* Assigned pages from Chapter 9 in LAW AND NEUROSCIENCE

For the Memory chapter, please make sure to review the eye witness memory section -- including the 2011 supplement. In the primary chapter .pdf, as you read / skim through the science (up to page 18), you need not get too bogged down in the details, but try to pick out the scientific findings that you see as most legally relevant. The summary that appears on pages 18-19 is quite useful. We will also talk about false memories, and you can review the case excerpted in the .pdf. Finally, if there is time we will talk about memory dampening and memory enhancement. (If we don't have time to get to this topic, we'll cover it later in the semester).

Week 6, 9/28/11. Brain-Based Lie Detection

- *Read before class:* Chapter 16 in LAW AND NEUROSCIENCE
- *Skim before class:* Assigned pages from Chapter 8 in LAW AND NEUROSCIENCE
- *Mock Opening Arguments for U.S. v. Semrau:* (1) Lead attorney for Government; (2) Lead attorney for Defendant Semrau

For the Lie Detection chapter, we will talk for sure about the Semrau and Harrington cases, so read through the excerpts pertaining to each. We will also cover the polygraph, so review the relevant cases included in the chapter. In the middle of the lie detection chapter, you're going to see a lot of science excerpts. Unless so inclined (e.g. this is what you're writing on and/or you are interested in the science behind it all), feel free to skim quickly past this. You can also skim the Indian cases, though we may touch on them if there is time. Finally, read the series of short excerpts at the end (presenting critiques and policy proposals), as we will evaluate them and also open up discussion to generate other ideas for how to legislate / regulate / adjudicate in this area.

Week 7, 10/5/11. The Damaged Brain & The Psychopath Brain

- *Read before class:* Chapter 26 in LAW AND NEUROSCIENCE
- *Skim before class:* Assigned pages from Chapters 7 & 8 in LAW AND NEUROSCIENCE
- *Mock Opening Arguments for Dugan case:* (1) Lead attorney for Government; (2) Lead attorney for Defendant Dugan

For week 7, which covers both the "damaged brain" and the psychopathic brain (chapter 26). I will start class by talking a bit about the attached article from Robert Sapolsky. You need not read the article, but you might find it interesting to at least skim before class. You should then ensure that you read each of the two cases in the supplement. We will hear opening statements on both cases. Then, in the chapter mockup, focus most especially on: Virginia Hughes, Science In Court: Head Case, 464 Nature 340 (2010); Greg Miller, Investigating the Psychopathic Mind, 321 Science 1284 (2008).and Stephen Morse, Psychopathy and Criminal Responsibility, 1 Neuroethics 205 (2008). You'll also want to read the Hare Scale. For those who want to dig into the brain science behind psychopathy, you can read the rest of the chapter in more detail (and also consult the further readings listed online).

[Fall Break: No class on Wednesday, 10/12/11]

Week 8, 10/19/11. The Crime Victim's Brain & The Veteran's Brain

- *Read before class:* Chapter 17 in LAW AND NEUROSCIENCE
- *Skim before class:* Assigned pages from Chapters 7 & 8 in LAW AND NEUROSCIENCE
- *Mock Opening Arguments for Allen v. Bloomfield Hills:* (1) Lead attorney for Plaintiff Allen; (2) Lead attorney for Defendant Bloomfield Hills

For week 8, you'll see that the chapter labeled "Neuroscience and Tort Law" is actually about more than just tort law. (Changes will be made to the book's organization downstream). For the purposes of our class discussion, we will do all of the following: (1) talk about how you would litigate a brain injury case (including the issue of causation, e.g. in the *Evenflo* case); (2) dive into the *Allen v. Bloomfield Hills Sch. Dist.* case (with opening arguments presented on both sides); (3) talk about the neuroscience of pain and how the law could / should respond; (4) talk about the trauma victim's brain, e.g. the law related to combat veterans' mental health claims. If there's time, we'll talk about NFL concussion litigation as well. If you are pressed for time, focus on the *cases*.

Week 9, 10/26/11. The Adolescent Brain

For week 9, we have a lot to get through. Here's how to prioritize the reading. Ensure that you get to *Roper* and *Graham* (both in the chapter 3 mockup). In addition, skim through the *Andrews* case (at the end of the chapter 20 mockup), which follows in the wake of *Graham*. In addition to those cases, we are going to tackle: (1) the issue of competency -- so read MacArthur Foundation Research Network on Adolescent Development and Juvenile Justice, *Adolescent Legal Competence in Court* (2007); (2) critical perspectives -- so read Terry A. Maroney, *The False Promise of Adolescent Brain Science in Juvenile Justice*, 85 NOTRE DAME L. REV. 89 (2009); and (3) the question of brain development in the context of access to abortion -- so read Laurence Steinberg, *Are Adolescents Less Mature Than Adults? Minors' Access to Abortion, the Juvenile Death Penalty, and the Alleged APA 'Flip-Flop'*, 64 *American Psychologist* 583 (2009). If you have time, and want to get more background on the juvenile justice system in the U.S., read: Elizabeth S. Scott & Laurence Steinberg, *Adolescence and the Regulation of Youth Crime*, 18 *THE FUTURE OF CHILDREN: JUVENILE JUSTICE* 15 (L. Steinberg, ed.) (2008).

Opening Statements:

- *Roper v. Simmons*
 - Govt: Ellen Forrester
 - Defense: Sam Brandao
- *Graham v. Florida*
 - Govt: Emily Johnson
 - Defense: Bailey Zydek

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development in the context of access to abortion -- so read Laurence Steinberg, Are Adolescents Less Mature Than Adults? Minors' Access to Abortion, the Juvenile Death Penalty, and the Alleged APA 'Flip-Flop, 64 American Psychologist 583 (2009). If you have time, and want to get more background on the juvenile justice system in the U.S., read: Elizabeth S. Scott & Laurence Steinberg, Adolescence and the Regulation of Youth Crime, 18 THE FUTURE OF CHILDREN: JUVENILE JUSTICE 15 (L. Steinberg, ed.) (2008).

Week 10, 11/2/11. Mental Health & The Addict's Brain

For Week 10 (Addiction): We will discuss both the Robinson case and the Powell case, and we'll hear arguments for each side of the Powell case. Read the Richard Bonnie summary piece (7 pages) for a good overview of how addiction is treated by law (and where the controversies lie). You can then skim through the science pieces providing background on the neurobiology of addiction. Do, however, take care to read the piece by Fenella Saunders, describing research by Read Montague and Gideon Yaffe. We will ask whether the reasonable person standard should be subjectivized (so read the Yaffe excerpt that is also included). The Husak / Murphy piece will be useful as background. Finally, we will try to get to some vexing policy questions related to regulation of drugs / addiction. The final part of the .pdf includes a couple of pieces of background on the debate over liver transplants for alcoholics. We will debate this as well.

- Powell v. State of Texas, 392 U.S. 514 (1968)
 - Govt: Kristie Leslie
 - Defense: Chathan Mangat

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Week 11, 11/9/11. Emotions and Decision Making

For Week 11 (Emotions): I am attaching two draft chapters. We will talk first about the general (and pervasive) intersection of emotion and law. For this general discussion, pay most attention to pages 8-18 in the Chapter 15 .pdf -- Part II. Laws Intersection with Emotion. After a general discussion, we will move specifically to the question of Emotion and Legal Decision Making (Chapter 22) . In the Chapter 22 .pdf, you can skim the science background and then focus most especially on the questions of: (A) the role of emotion in judging [see the Sotomayor hearing excerpt]; (B) Emotion in juror decision making / Victim impact statements; and (C) Emotion in civil damages.

Week 12, 11/16/11. Regulation and Legislation

For Week 12 (Regulation and Legislation): The reading this week is relatively light. (This is allowing you extra time to work on your papers - so take advantage of it). We will cover four topics related to regulation and legislation: (1) cognitive enhancement; (2) memory dampening [picking up where our memory discussion left off]; (3) mental health parity laws; and (4) new fetal pain legislation. The .pdf is only 22 pages long, and the reading will be quick. (You might want to refer back to our memory dampening reading from the Memory chapter). Since the reading load is light, I expect everyone to come to class prepared.

[Thanksgiving Break: No class on Wednesday, 11/23/11]

Week 13, 11/30/11. The Machine Brain: Legal Implications of Artificial Intelligence

For Week 13 (Artificial Intelligence): We will end the course with a future-looking session on Artificial Intelligence and Neuroprosthetics. Ensure that you read the 5 page supplement (which will raise questions about whether lawyers or machines are better at certain types of discovery). Also ensure that you read these two pieces -- Steve Connor, Computers to Match Human Brains by 2030, and Alan Turing, Computing Machinery and Intelligence [the Turing excerpt is from one of, if not the, most classic work on AI]. I will talk in class a bit about new developments, show some video of what is now being done, and encourage you to think about what the future will look (and just as importantly -- when the "future" will be here). The big picture questions have to do with how changes in AI, and in brain-machine interface, will (or will not) and should (or should not) affect life and the law. To see some lawyers who think about this, check out: <http://www.iaail.org/> and to see more about our potential future, see: <http://singinst.org/>