Collaborative Project Report

UNIV 3275: The Ethics of Artificial Intelligence

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Words: 1120

<u>Overview of Project Theme Concept and Objectives</u>

The primary motivation for writing this play was to inspire our readers and audiences to personally confront the practical and ethical questions we considered ourselves during the writing process. This play depicts a court case in a possible future where sentient artificial intelligence gains constitutional protection to legal personhood. We intended to explore three different roles an AI could play in a court case through one situation where they interacted with one another and human characters. Firstly, through our discussion and research, the judge turned out to be fairly similar to a human judge in many respects (control of the courtroom and logical reasoning skills). However, the judge depicted in our story lacked emotion and empathy, which could render the legal system even less relatable for many citizens. As for the expert witness AI, our situation was extremely specific in that it was testifying against the defendant to show that other AIs could have made different decisions in the same context. One can imagine AI being used in many other ways as evidence on either side of a case to provide more complete information on the facts at hand. Finally, with the defendant AI we were able to directly explore the practical and theoretical implications that granting personhood to AI would have on our legal system. Although much of our answer surrounded the particular background we created for our story, our hope is that the case will provoke thoughts (and perhaps reconsiderations) as to whom or what the audience members' hold ethical responsibilities toward. The project allowed us to enter multiple conversations by placing an ethical question of an AI application at the heart of the trial, but surrounding it with other AI applications with less direct, but still evident, ethical considerations.

These ethical considerations were emphasized through the comparatively empathetic human characters who expressed more emotion. The nurse has to take a moment when she remembers the patient dying, and the programmer gets heated and protective when he feels his professional work is being attacked. These small moments help audience members to reflect on what biases they have and by which standards they can judge. We purposefully picked gender neutral names in the hopes that the director takes liberties in assigning the most apt cast, as possible, but also to make it evident that the comparison was between AI and the human experience as opposed to a specific social standard of the human experience (e.g. we did not want the nurse to appear more sympathetic because of gender

stereotypes if we casted her as a female as opposed to being more sympathetic to a patient's death because she is human).

Importantly, the audience is a crucial part of this story by playing the part of the jury. Moving towards the future, whether it is in the legal sphere or otherwise, the public must begin to think about how to incorporate AI into our human society. We aimed to begin this dialogue amongst members of the audience by allowing their initial reactions to the play as they leave the theater to be comparable to the actual jury deliberations. Moreover, like a jury, the final decision is unanimous, which we hope people will remember as they debate and find it hard to reach conclusions. There is no clear ruling in the case, however, as both sides make pertinent points relating to responsibility when AI functioning goes awry. We are well aware that we did not tackle all of the possible nuances to this issue, but we hope that this story can be used as inspiration for other scholars and concerned citizens to think about these important questions.

Reflection on Class Fair Experience

The Class Fair was a great experience to showcase our work and made us feel more confident about it because the responses were overwhelmingly positive. Many classmates and fair attendees came up to our table, enchanted by the giant "The 28th" playbill. I think the large playbill attracted our visitors and helped us convey the background context of our play.

The biggest disappointment expressed amongst viewers was that we had not acted out the play. We chose not to do so due to the length of time each scene would take a viewer at the fair and that it was more important in this presentation setting to be able to discuss the purpose and implications of our work; however, we still inspired intellectual discussions about our project. When people learned that our play was set in a society where the 28th amendment granted legal personhood to artificial intelligent agents, this sparked immediate interest and emphasized the need to initiate a conversation about the ethical implications of artificial intelligence now. We also had copies of our script for people to thumb through and get a glimpse of the intensity of some of the specific scenes. While people looked through the script, they usually noticed the names of characters like MURRAY or XENON first. This started a conversation about the characters background story, personalities, the positions of

the AI's in the courtroom, and how these roles revealed themselves through the dialogue we articulated.

We had a few issues in explaining the case or the complex ideas to passer-bys since we broke up the explanation into background, characters and general plot. The biggest challenge, per se, is that we did not come to a solid conclusion on whether the AI defendant was actually liable. Though that was our intention, it would have been interesting to survey the passer-bys on their personal jurisdiction. We could have had everyone pre-read the script (or possibly video) and engage in a discussion about who they thought was liable when they walked up to the booth. Many people asked our personal opinion on the final jurisdiction of the case, which we discussed but we did not even reach a final conclusion amongst ourselves, stressing the variety of questions and considerations presented in the play. One interpretation is that Murray is liable and the death of the patient was indeed malpractice. Another interpretation is that no one is liable and the case should be settled because it was a mistake made at an instantaneous judgement call that could have happened to anyone. A third interpretation is that the programmer is liable, despite Murray having legal personhood, since he is the one who coded the decision making process. Finally, another line of argumentation follows that faulty programming could be equated to mental instability and Murray is found guilty but under the insanity plea. Regardless of one's personal conclusion as to the fate of Murray, the class fair gave us new insight to the perceptions of AI's in the general public.

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Appendix

The 28th

By

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The primary motivation for writing this play was to inspire our readers and audiences to personally confront the practical and ethical questions we considered ourselves during the writing process. The audience is a crucial part of this story; moving towards the future, whether it is in the legal sphere or otherwise, the public must begin to think about how to incorporate AI into our human society. This play, depicting a court case in a possible future where sentient AI gains constitutional protection to legal personhood, is intended to begin this dialogue amongst members of the audience (this is why the final decision is unanimous--to spur conversation). There is no clear ruling in the case, however, as both sides make pertinent points relating to responsibility when AI functioning goes awry. We are well aware that we did not tackle all of the possible nuances to this issue, but we hope that this story can be used as inspiration for other scholars and concerned citizens to think about these important questions.

Our intention was to explore three different roles AI can play in a court case in one situation. Firstly, through our discussion and research, the judge turned out to be fairly similar to a human judge in many respects (control of the courtroom and logical reasoning skills). However, the judge depicted in our story lacked emotion and empathy, which could render the legal system even less relatable for many citizens. As for the expert witness AI, our situation was extremely specific in that it was testifying against the defendant to show that other AIs could have made different decisions in the same context. One can imagine AI being used in many other ways as evidence on either side of a case to provide more complete information on the facts at hand. Finally, with the defendant AI we were able to directly explore the practical and theoretical implications that granting personhood to AI would have on our legal system. Although much our answer surrounded the particular background we created for

our story, our hope is that the case will provoke thoughts (and perhaps reconsiderations) as to whom or what the audience members' hold ethical responsibilities toward.

In addition, here are a few, but not all, random things we considered in our writing process:

- The defendant (Murray) is named after the first doctor to ever perform a successful kidney transplant.
- The names of all the human characters are purposefully typical gender-neutral names as to allow each director complete freedom to cast whomever they believe suits the position well.
- How would standards of proof in criminal cases apply to sentient AI? How to prove a guilty mind? Can the defendant plea insanity?
- The 28th Amendment to the US Constitution, within our storyworld, became politically and economically necessary because the sentient AI went on strike and refused to perform their function if they were not granted legal personhood.
- The patient who died is named Elon Bezos, a compilation of Elon Musk and Jeff Bezos, to represent the gravity of the situation as a very powerful individual was the victim of this case of (possible) medical malpractice.
- We encourage each director to take creative liberties to make this story their own. We are intending to start a dialogue and this vision can only be realized if each subsequent individual who encounters it adds their own personal spin.

Thanks and Enjoy,

Alexa Cordell, Sam Kahn, Sam Smith

JUDGE, an AI system.

PROSECUTION, human lawyer fighting for the plaintiff.

DEFENSE, human lawyer defending MURRAY.

MURRAY, an AI is the defendant being sued for malpractice. Created by NELSON and in practice at Milton Medical.

THOMAS, Dr. Logan Thomas, is called in as an expert witness in transplant practice.

XENON, expert witness AI from a competing company.

BOWEN, Pat Bowen, nurse at Milton Medical that was in the OR with MURRAY

NELSON, Cameron Nelson is the programmer of MURRAY.

CLERK, the clerk of the courtroom.

BEZOS, Elon Bezos is the patient who died during the kidney transplantation.

Scene 1. OPENING STATEMENTS

Lights up.

Upstage right rests a mahogany judge's seat, with a witness stand to the right and a clerk's table to the left. Behind them is an American flag. The judge sits at the bench. The clerk sits at his table.

Upstage left is the table for the prosecution with the attorney, PROSECUTION, at the table. Mid-stage left, angled toward the audience, is the table for the defense. The defense, DEFENSE, and the defendant, MURRAY, are behind the table.

PROSECUTION: Your honor, ladies and gentleman of the jury: I stand before you in a unique position. Never before has the world seen an Artificial Intelligence system on trial as a legal person. But here we are, just two months after the passage of the 28th amendment to the United States Constitution which declared "...all complex sentient life capable of experiencing self-consciousness and upholding legal and moral responsibilities worthy of judgment under the law…" The AI system in question clearly fulfills this standard. *Passionately* Let us set a precedent in this courtroom today that the legal system intends to affirm Congress's amendment to lead the United States and the world into an expanded, more inclusive future of legal personhood. Let us drop our biases. The defendant, and all the other AIs in the room, ought to be held to the same standard as the rest of us. With this respect comes accountability. There was a death. At the hands of an AI. This fact is undeniable. Throughout the day, you will hear my arguments for why I think you, the jury, *Motions to the audience* ought to hold the world's

first AI defendant liable for the damages incurred due to its malpractice during the kidney transplant surgery of Elon Bezos. Ultimately, it was the defendant who neglected the patient's life in order to complete the surgery. The evidence that follows will prove this definitively. Remember: this AI is a legal person now, let's hold it accountable as one. Thank you.

DEFENSE: Your honor, ladies and gentleman of the jury: I agree with the opposition that it is crucial to the future of our legal system that we uphold the 28th amendment and treat all complex sentient life as legitimate legal persons. However, by no means does it follow that you all have a responsibility to hold this defendant liable for the death of Elon Bezos. In fact, it is crucial not to let the simple reality that this if the first case of its kind to blind you from justice. There may be specific individual people, and perhaps corporations, responsible for the death in question, but not the defendant. There will be other trials for them, I assure you. Justice must bring her fist down upon the guilty parties to avenge this unnecessary death and ensure that nothing like it happens again, but neither of those goals will be achieved by finding the defendant liable. Throughout this trial, the parties truly culpable for the damage will be revealed and you, as the jury *Motions to the audience* will be compelled to absolve the defendant of all responsibility in the death of Elon Bezos. Thank you, your honor.

Lights down.

Scene 2. DIRECT EXAMINATION OF MURRAY

Lights up.

CLERK: Please state your identity for the court.

MURRAY: *In robotic tone.* Murray. Model A1398. Serial number F17XF3RUKPFW.

CLERK: You may be seated. *Murray rolls over to the stand, wheels whirring before coming to a halt, with his robotic arms sprawled around the podium.*

PROSECUTION: You are an intelligent and sentient surgical robot programmed for kidney transplants. Is that correct?

MURRAY: That is correct.

PROSECUTION: What company created you and when?

MURRAY: I am from NephroBot Technology Corporation. I was incorporated on July 1, 2034.

PROSECUTION: What can you tell us about NephroBot Technology Corporation?

MURRAY: NephroBot Technology Corporation has been the global leader in kidney transplant surgical robots for the past five years. There are over 500 bots in over 34 countries worldwide that perform the surgery that I do.

PROSECUTION: How are you trained?

MURRAY: I am not trained in the way that human doctors are. I am programmed to do a function. Transplant Kidneys.

PROSECUTION: If you do not have training, how do you know how to perform transplants?

MURRAY: I know how to perform transplants because of my hardware such as microscopic 3D camera vision, distance sensors that detect up to 0.01 mm depth difference, self-sterilization of cutting devices and software like the high-speed deep learning algorithm that runs on intel processors. The algorithm is updated through a neuro-link network shared between all 500 NephroBots. Everytime a robot performs a surgery, the data learnings are uploaded to the cloud which update the machine learning algorithm which controls my decision making.

PROSECUTION: How do you ensure that the standard of care is satisfied?

MURRAY: My pre-operative plan enables more accurate kidney positioning than traditional surgeries. An assistant uploads the CT data to the cloud which I can access. The CT data is segmented to create a 3D model of the patient's kidneys and urinary tract. This individualized model and potential risks are presented and disclosed to the patient prior to surgery.

PROSECUTION: How many operations have you done?

MURRAY: 1,825 kidney transplants or roughly 365 per year. This is a 62% increase than the most experienced human kidney transplant surgeon to date.

PROSECUTION: Was this operation different from previous operations?

MURRAY: No. I transported the kidney successfully. I have never severed an artery before. The patient was in critical condition.

PROSECUTION: Elaborate on critical condition.

MURRAY: Pre-operation, the patient's estimated glomerular filtration rate was at 14% which is stage 5 of chronic kidney disease and indicates imminent kidney failure. The patients severely increased albuminuria concentration indicated 317 mg/g which places them in category A3. The combination of GFR and A3 places them in the highest risk for progression, morbidity and mortality. The patient had already been on the waitlist for 2 years and had blood type O, which is the most difficult to match.

PROSECUTION: Despite the patient's condition, you still severed an artery which is a major mistake. You must have miscalculated.

MURRAY: No, I did not miscalculate. The options both had high probabilities of failure.

PROSECUTION: So you admit you failed.

MURRAY: Failing does not mean I miscalculated. The patient understood and consented to the risks before entering surgery.

PROSECUTION: So how do you calculate and make decisions during a surgery?

MURRAY: My algorithm runs on logic-based decision trees. These decision trees assign estimated utilities and probabilities to the decisions I could make. I always choose the decision that optimizes utility and minimizes cost.

PROSECUTION: Under what circumstances would losing a patient's life be considered "optimal"?

MURRAY: The patient had a family history of heart disease, was 71 years old, slightly overweight and had a history of smoking and alcohol abuse in his early adulthood. While these circumstances usually would have affected transplant candidacy, the patient was listed at multiple transplant centers and still ranked high due to the severity of his condition and prestigious family name. There was a 75% chance he would survive the operation, given his numerous health conditions. These were all the risk-factors that contributed to the high likelihood of death in every possible decision I could make, optimal and otherwise.

PROSECUTION: But the patient didn't die from other health conditions. He died from a severed artery and blood loss. That seems like negligent miscalculation to me.

MURRAY: No sir. The presence of multiple renal arteries should not be considered as a factor of transplantation failure. There is not statistical difference in survival between patients who receive one renal artery or those who receive more than one. This patient received a transplant kidney with only one renal artery. However, during the vascular reconstruction phase of this surgery, the patient developed an arterial thrombosis that stopped blood flow to the brain. Once this clot was detected by one of my 12 monitoring 3D cameras and laser vein identification, I attempted to remove the clot, which is when the incident occurred. I should note that if it were not for these cameras, the thrombosis would have gone undetected and the

transplantectomy would have been completed without detection which would have caused terrible angina or eventual death.

PROSECUTION: What was the probability of survival had you not tried to unclot the thrombosis?

MURRAY: 0-10% by my estimation. With only one functional renal artery, this clot would have obstructed the blood flow to the transplanted kidney and resulted in failure. In an acute situation, medication may be infused into the renal artery to break up the clot, but there was a 60% chance this patient would reject this medication.

PROSECUTION: And you believe these calculations are accurately balanced?

MURRAY: Yes.

PROSECUTION: No further questions. *PROSECUTION returns to his bench.*

JUDGE: Does the defense have any questions?

DEFENSE: Just a few, your honor.

JUDGE: You may proceed.

DEFENSE: Thank you, your honor. *Turns abruptly toward Murray on the stand.* So, Murray, will you please remind the court of how you make your decisions during surgery?

MURRAY: My algorithm runs on logic-based decision trees. These decision trees assign estimated utilities and probabilities to

the decisions I could make. I always choose the decision that optimizes utility and minimizes cost.

DEFENSE: And how are these estimated utilities and probabilities calculated?

MURRAY: The algorithm is updated through a neuro-link network shared between all 500 NephroBots. Everytime a robot performs a surgery, the data learnings are uploaded to the cloud which update the machine learning algorithm, which controls my decision making.

DEFENSE: Right. To clarify my question, I am asking what is valuable according to your algorithm?

MURRAY: My purpose is to complete the kidney transplant with minimal costs to the patient, hospital, and NephroBot Technology Corporation.

DEFENSE: And why is that your purpose?

MURRAY: That is how I was programmed.

DEFENSE: No further questions, your honor.

Lights down.

Scene 3. DIRECT EXAMINATION OF HUMAN SURGEON

Lights up on scene with a spot on a middle aged doctor, THOMAS, behind the witness stand. His hair is greying and he is in a black suit and patterned tie.

CLERK: Please state your first and last name for the court.

THOMAS: Dr. Logan Thomas

CLERK: You may be seated. *Thomas sits at the stand. Lighting on stage evens out some, so spotlight still on Thomas but prosecution and defense increase in visibility.*

PROSECUTION: Dr. Thomas, you are the head surgeon at St. Marshall Medical Center, correct?

THOMAS: Yes.

PROSECUTION: Can you tell the jury a little bit about your education and background?

THOMAS: I attended Wisconsin for undergrad and graduated with honors in Biology before staying at Wisconsin for Medical School. I began my residency and spent most of my time in pediatrics. I obtained a fellowship position at John Hopkins in pediatric transplantation, which led me to become passionate about transplant surgeries and treatments which I have now been performing for ten years. I now lead the transplant practice at Marshall Medical and have done so for three years.

PROSECUTION: So you consider your medical specialty in transplantation?

THOMAS: Yes, I'm specialized in kidney transplant surgery.

PROSECUTION: And how many transplant surgeries have you had experience with?

THOMAS: Oh well we average about 200 transplants a year that I oversee, so I've approved roughly 600 transplants in my

position. I myself have performed, oh probably 700-750 surgeries at this point in my career.

PROSECUTION: And what percentage of those are kidney transplants?

THOMAS: Almost all. If I had to put a number on it, I suppose 90, 95 percent of them.

PROSECUTION: and being familiar with the events in question, have you also experienced the unplanned severing of the renal artery and excessive bleeding during a surgery?

THOMAS: Yes. It's happened twice to me personally.

PROSECUTION: And what did you do?

THOMAS: I opted to stop the bleeding, but it's really a judgment call on the part of the physician.

PROSECUTION: Why did you choose to stop the bleeding?

THOMAS: Well, I was afraid they would die or at least go into shock that would prevent the success of the transplantation. You see people come in everyday waiting for an organ, and you don't want to waste it, but I've always put the life above the chance of saving the organ, personally.

PROSECUTION: And what was the most likely outcome of completing the transplant without stopping the bleeding?

THOMAS: Well it'd be a toss up and dependent on the patient, but obviously, here it was death.

PROSECUTION: No further questions, your honor.

JUDGE: Does the defense have any questions?

DEFENSE: With the alternatives of losing life or the organ, from your experience, what would have happened if the the patient had lived but had an unsuccessful transplant, what would have happened to the patient?

PROSECUTION: Objection, your honor. Calls for speculation.

JUDGE: Calculating observable outcomes. Sustained.

DEFENSE: You said it's a judgement call. What informs the judgement of a physician in your experience?

THOMAS: Training and experience.

DEFENSE: So these things pretty much decide what you are going to do based off of what you've seen and been told before?

THOMAS: Yes. That and your conscience.

DEFENSE: So your personality can bias you to choose something that you are more comfortable with regardless of the outcome to the patient?

THOMAS: I wouldn't call it bias or indifference.

DEFENSE: What would you call it?

THOMAS: Judgement. It's just personal judgement.

DEFENSE: So your character, experience, training, that's all part of your programming, per se? This is how you make your decisions?

THOMAS: I guess you could say that, yes.

Lights down.

Scene 4. PROSECUTION DIRECT EXAMINATION OF XENON (AI EXPERT)

CLERK: Please state your identity for the court.

XENON: *In robotic tone* XENON. Model Z1762. Serial number X29XR4VLBAWR.

CLERK: You may be seated. *Xenon rolls over to the stand, wheels whirring before coming to a halt, with his robotic arms sprawled around the podium.*

PROSECUTION: You are also an sentient, artificially intelligent surgical robot programmed for kidney transplants. Is that correct?

XENON: That is correct.

PROSECUTION: What company created you and when?

XENON: BioBot, Inc. created me. I was incorporated November 27, 2035.

PROSECUTION: Tell me about BioBot, Inc.

XENON: BioBot, Inc. makes all kinds of surgical robots and tools. They started as a Silicon Valley startup and have slowly grown to 200 hospitals in the United States.

PROSECUTION: How are you trained?

XENON: I am trained to follow a code of ethics and surgical procedure. I prioritize saving the human patient's life.

PROSECUTION: How do you know how to perform transplants?

XENON: Before deploying me in the field, BioBot ran multiple 3D surgical simulations that we commit to our database memory. I also learned by performing surgery on a dummy. The dummy has sensors in all major organs and arteries that simulate problems and life-threatening situations. The robots eventually deployed in field are the ones that save the human's life 99.99% of times. I passed this training, so I was deployed into the field.

PROSECUTION: How do you ensure that the standard of care is satisfied?

XENON: Every decision I make is validated against the code of ethics. If there is a risk factor that does not align with the ethical standards, a decision will not be made.

PROSECUTION: How many operations have you done?

XENON: 150 operations in the past year.

PROSECUTION: So how do you calculate and make decisions during surgery?

XENON: My algorithm also runs on logic based decision trees, but using a methodology that checks the decision against the code of ethics before performing it.

PROSECUTION: How was this case different from operations you've completed?

XENON: I have never severed an artery before, except in simulation training. But I chose to save the patient's life by stopping the bleeding instead of completing the operation.

PROSECUTION: Do you think that Murray miscalculated then?

XENON: Yes. I think that Murray should have made the decision that optimized utility and minimized risk. He claims that he made that decision, but I think there must have been a miscalculation in those probabilities because the patient's life should always be prioritized.

PROSECUTION: No further questions.

JUDGE: Does the defense have any questions?

DEFENSE: Yes, your honor.

JUDGE: You may proceed.

DEFENSE: Xenon, do you have free will?

XENON: No, but neither do you. We are the same.

DEFENSE: Setting the metaphysics of humanity aside for now, why do you not possess free will?

XENON: I was programmed to respond to a given particular set of inputs with a particular output. I use decision trees to find the optimal output and then check the decision against the code of ethics before performing it. It is a computational process.

DEFENSE: You stated before that your hardware and software was made by BioBot, Inc. is this correct?

XENON: Yes.

DEFENSE: Is it true that the only people that have access to your processing software are BioBot Inc. and its employees and AI?

XENON: Yes, and at Biobot, the AI are employees.

DEFENSE: Of course, I remember seeing a headline about that after the strike ended. So no one except BioBot workers has access to your reasoning and communication processes?

XENON: *Quickly* Yes.

PROSECUTION: Objection, argumentative.

JUDGE: Sustained.

PROSECUTION: *Quietly to herself.* God damn they make these things too quick.

DEFENSE: Is it possible for anyone to hack your system to change either of these functions?

XENON: No, my software is encrypted with one of the most secure systems in the world, second only to the US military.

DEFENSE: Great. So it is fair to assume that all of your responses to questions in this courtroom today were determined by the communication processing software that BioBot, Inc. installed in you?

XENON: Yes.

DEFENSE: Thank you for that response, *long pause,* BioBot, Inc. *pause*

The prosecution wrestles in their seats but Xenon remains still, emotionless.

DEFENSE: Given the fact that both BioBot, Inc. and NephroBot Technology Corporation design, program, and construct sentient AI for medical treatments, such as yourself and Murray, would it be fair to characterize these two companies as competitors?

XENON: Yes.

DEFENSE: Given your status as an employee of BioBot, Inc., do you view NephroBot Technology Corporation as competitors?

XENON: I have never considered that.

DEFENSE: But the executives and programmers for BioBot likely have?

XENON: Yes.

DEFENSE: So, knowing that you were being brought in as an expert witness to testify against an AI employee of NephroBot Technology Corporation, these members of BioBot Inc., which you just agreed have sole access to your software and have significant vested interests in defacing NephroBot and its employees, could ensure that you will say anything the prosecution needs you to say to prove Murray is liable for malpractice?

XENON: I cannot say.

DEFENSE: Xenon, do you believe executives and programmers at BioBot Inc. are using their control over your functioning today to gain a competitive legal advantage over their competitors?

PROSECUTION: OBJECTION!

JUDGE: Sustained.

DEFENSE: No further questions, your honor.

Lights down.

Scene 5. DIRECT EXAMINATION OF BOWEN (NURSE, EYE WITNESS)

Lights up.

JUDGE: Is the defense ready with its case?

DEFENSE: Yes, Your honor. I call Pat Bowen.

CLERK: Please stand. Raise your right hand. Do you promise that the testimony you shall give in the case now before the court shall be the truth, the whole truth, and nothing but the truth, so help you God?

BOWEN: I do.

CLERK: Please state your name.

BOWEN: Pat Bowen.

CLERK: You may be seated.

DEFENSE: Can you please state your relationship to Murray?

BOWEN: I served as the cardiac nurse in the OR during this operation.

DEFENSE: How long have you acted as a cardiac nurse?

BOWEN: I was trained and first certified about twenty years ago. I stopped working for about 5 years to help raise my kids, and I returned to the position about 8 years ago. During that time, I have always worked as a cardiac nurse, starting in the hospital setting. When I returned to work, I began in an ophthalmology outpatient practice, and now I have been working in the OR at Murray Medical, primarily with the transplant team, for about 4 years.

DEFENSE: So you've worked with Murray for four years?

BOWEN: I've worked with technology like Murray for about 5 years. The ophthalmologist I worked with replaced a retiring colleague with a KADRIK, which was one of these earlier technologies to do basic outpatient lens replacements. I was brought to Milton Medical when they upgraded their technology to the Murray system. I work with both the human surgeons and the Murray machines. I hadn't worked with this particularly unit number since I'm normally in the other operating room, but that nurse was out so I filled in.

DEFENSE: and what is your role in the operating room?

BOWEN: As a cardiac nurse, I monitor patient vitals during the operation.

DEFENSE: What was the experience like in the OR the day of the operation in question?

BOWEN: *Reminiscent* Well, it was normal until it wasn't. *BOWEN runs his hands through his hair, as he thinks*. The patient had normal vitals, and I had no particular concerns with their medical background, medicines, or reaction to sedation that

would have concerned me, so it was all very normal. Until obviously when the renal artery was severed. At that point, the bleeding caused the heart rate to spike. As the transplantation was completed, it plummeted. *Pause.* And that was it. *Pause, remembering the patient's death*. Well not totally it, of course since there wasn't a DNR, so we tried some standard resuscitation techniques but the probability of resuscitation was minimal so it felt like a violation of the body to keep trying. Which is the standard response to respect the patient.

DEFENSE: Thank you for detailing the experience. *Leading* To clarify, the experience in the room was entirely normal?

BOWEN: *Catching his tone, BOWEN becomes defensive.* I wouldn't call a patient's death normal. *Cooling off*. But yes, everything was handled according to procedures that are in place.

DEFENSE: So you don't believe Murray experienced any type of glitch that would have impaired its decision-making?

BOWEN: No.

DEFENSE: What was the tone of the operating room like when that decision was made? Were you nervous?

BOWEN: Well yes, of course. Murray made the decision almost instantaneously so we wouldn't lose the kidney, so at that specific moment, I don't know, but the patient went into shock quickly after.

DEFENSE: So the decision had to be made in a split moment which decided the fate of the patient?

BOWEN: Yes. It was a toss up from my perspective as to the choice, but Murray made it quickly which was the best bet-- either way would have worked.

DEFENSE: And Murray made it without any obvious errors or glitches from your perspective?

BOWEN: Yes.

DEFENSE: No further questions, your honor.

JUDGE: Does the prosecution have questions for the witness?

PROSECUTION: No questions at this time.

Lights Down.

Scene 6. DEFENSE EXAMINATION NELSON (PROGRAMMER)

JUDGE: Does the defense wish to call up another witness to the stand?

DEFENSE: Yes, your honor. I call Cameron Nelson.

CLERK: Please stand. Raise your right hand. Do you promise that the testimony you shall give in the case now before the court shall be the truth, the whole truth, and nothing but the truth, so help you God?

NELSON: Yes I do.

CLERK: Please state your name.

NELSON: Cameron Nelson.

CLERK: You may be seated.

DEFENSE: Can you please state your relationship to the defendant, MURRAY?

NELSON: I programmed it. Or, errm… him… or whatever they call it these days. I created him. I like to think of myself as a god ever since the amendment passed recognizing sentient AI as legal persons. *Chuckles to himself. All the humans in the room awkwardly fiddle in their chairs and give half-hearted smirks. AI characters remain perfectly still, emotionless*

DEFENSE: So you work for Nephrobot Technology as a software developer?

NELSON: Nephrobot Technology Corporation, I do.

DEFENSE: Right. And how long have you worked for Nephrobot Technology Corporation?

NELSON: This upcoming June will be my fifth year with NTC.

DEFENSE: Did you have any experience as a software developer before joining NTC?

NELSON: Oh, Nephrobot? No, Nephrobot was my first job. Straight out of undergrad. Something I am very proud of.

DEFENSE: Do you generally consider yourself good at your job?

NELSON: I wouldn't still be around if I wasn't. My bots are being used in hospitals all around the world for all sorts of medical procedures: surgeries, therapies, you name it.

DEFENSE: And has an action taken by any of the bots ever resulted in the patient's death?

NELSON: *Proudly* Nope!

DEFENSE: Until Murray?

NELSON: *Slouches* Suppose so…

DEFENSE: Do you believe Murray made a miscalculation?

NELSON: No, my bots never miscalculate. It's all a probabilities game-- he got unlucky. I feel bad for him, my bot does not deserve to be held liable for this situation. It was out of his control.

DEFENSE: So if Murray did not miscalculate, can you explain what he did correctly?

NELSON: His purpose is to finish the surgery with minimal costs. It's all probabilities. He was trying to finish the kidney transplant.

DEFENSE: So in your opinion, Murray did everything right during the kidney transplant in question?

NELSON: Yes.

DEFENSE: Is there any possibility that Murray's software was compromised by an external, possibly malicious actor looking to sabotage this surgery?

NELSON: No. Our technology is encrypted and if anyone gets through our walls, it sends an automatic feedback loop to alert all of the relevant software designers on the Nephrobot team,

including me, of course. The system is flawless. I got no such alert.

DEFENSE: So it seems to me that you believe this procedure was done according to your and NTC's standards. Is this a fair representation of your view?

NELSON: Yes.

DEFENSE: So Murray should not be liable?

NELSON: Correct.

DEFENSE: Would you feel comfortable putting Murray back into the field, regardless of the outcome of this case?

NELSON: I would, absolutely. I have the utmost confidence in my creations.

DEFENSE: No further questions.

JUDGE: Does the prosecution have questions for the witness?

PROSECUTION: Tell me more about the algorithm you programmed in Murray.

NELSON: *In an arrogant tone* The rudimentary and high level explanation is that he runs on a machine learning algorithm in which data structs are imported from the neuro-link network between 500 some robots performing surgeries all over the world.

PROSECUTION: What's the purpose of this large network?

NELSON: Essentially, Murray gets better every time he performs a surgery. He can process "memories" and "learnings" from his own operations, but also every operation performed with a Nephrobot

Technology robot. Murray has performed 1,825 operations himself, but has the mental processing "experience" of tens of thousands.

PROSECUTION: Is that not an invasion of privacy if he sees patient data that he does not even operate on?

DEFENSE: Objection, your honor. Relevance to this case is unclear.

JUDGE: Overruled.

NELSON: No all data is generalized and encrypted, so no patient data is revealed. Post surgery, a mathematical model is automatically generated and uploaded to the database in the network.

PROSECUTION: If he has access to such "experience" how could such a tragedy have occurred?

NELSON: Well clearly sir, you lack the understanding of how rare this case was. And have failed to do your research on the national standards of malpractice by human surgeons. One mishap out of approximately 10,000 surgeries gives a 0.01% failure rate. Meanwhile the rate for victims of human malpractice is closer to 1%! Changing the statistical output by 2 orders of magnitude is unheard of in human medical procedure improvement!

PROSECUTION: I understand the rarity of this case, Mr. Nelson. The statistical improvement though does not justify losing a life. Why do you not have a code of ethics, like XENON, that your bots cross-reference during decision making?

NELSON: *Huffing and Puffing* First of all, XENON is oversimplifying the complex software engineering it takes to

prioritize ethical decisions. Second of all, MURRAY is programmed to prioritize COMPLETING THE OPERATION! REPLACE THE KIDNEYS! THAT IS ALL!

JUDGE: Mr. Nelson, you must respect the Court. Your voice must stay below 100 decibels or you will be held in contempt of court. Prosecution, you may continue.

PROSECUTION: Thank you, your honor. Now, please continue explaining why your robot lacks a code of ethics.

NELSON: *In a calmer but frazzled tone* Murray's deep learning architecture enables his computer vision, speech recognition, natural language processing, audio recognition, medical image analysis and material inspection. His neural network has a few billion units and connections, exceeding the human brain, allowing him to perform the aforementioned tasks beyond the human level. The 28th Amendment to the United States Constitution granted legal personhood to types of beings with this level of brain capacity. It would have been a public health disservice to not pass them as legal persons.

PROSECUTION: Can you return to the question?

NELSON: I am getting there! *Working himself up.* His DNN models complex linear relationships. DNN architectures generate compositional models where the object is expressed as a layered composition of primitives. The extra layers enable composition of features from lower layers, potentially modeling complex data with fewer units than a similarly performing shallow network. In other words, you do not simply "program" a code of ethics as subjective values the way we discuss in normal conversation.

Everything must be weighted computationally. At NephroBot, software engineers were instructed to prioritize finishing the operation, to become the global leader in successful kidney transplants, not save lives. *He catches himself*. Well, I mean… *PROSECUTION cuts him off with the next question.*

PROSECUTION: So by your discussion, it would be Murray's own decision making that resulted in negligence and ultimately the patient's death? *NELSON is frazzled.* I have no further questions.

JUDGE: Does the defense have further questions for the witness?

DEFENSE: Yes, your honor. Just one question. *Walking over to the witness stand.* You say "Murray is supposed to replace kidneys, not save lives," Why is that?

NELSON: *Showing signs of exhaustion from the frustration of the prosecution's questioning.* Well, *NELSON shakes his head as he sorts through what all has happened and offers his response with a shrug.* because I programmed it that way.

DEFENSE slowly nods, as if to signal a major point has been discovered that needs processing. The DEFENSE begins to walk away from the witness stand but before reaching its bench, turns, and poses a final question quizzically.

DEFENSE: So are you at fault?

Lights out. Scene Ends. Curtain closes.

The JUDGE's voice resonates through the theater.

JUDGE: Members of the jury, it is your function and responsibility to decide the facts of this case. Your finding must be based on the testimony delivered here today and conclusions fairly drawn from that evidence. You must consider and decide this case fairly and impartially. The burden is on the plaintiff to prove by the preponderance of the evidence each item of damage claimed to be caused by the defendant. In considering the items of damage, you must keep in mind that your award must adequately and fairly compensate the plaintiff. You solely must judge the reliability of the testimony. You may apply your own common sense and everyday experiences. All persons stand equal before the law and are entitled to the same treatment under the law. You should not hold prejudice or sympathy for or against any party. In order that you may reach a verdict in this case, you must each agree upon it. Your verdict must be unanimous.

THE END.