“Quantum Consciousness”

The Robot Musical

Written by
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Adapted to eleven robots and four acts in an interactive robot theatre by Marek Perkowski

Version 1.8.

December 30, 2014

Robots: (red in acts 1 and 2, green in act 3, blue in act 4).

ANDROID ROBOT ACTORS:

1. **QT1. Professor Niels Bohr.** Inventor of atom model, top contributor fundamental ideas in Quantum Mechanics. Father of Quantum Mechanics.
2. **QT2. Professor Albert Einstein.** Nobel Prize in Quantum Mechanics, Inventor of Relativity Theories, hated quantum mechanics of Bohr because of its indeterminacy. He played violin for fun.
3. **QT3. Professor Schrödinger’s Cat.** The famous cat of Quantum Mechanics, it is a superposition of two basic states, in his case |dead⟩ and |alive⟩. Cat was introduced as a mind experiment by Schrödinger, the creator of Schrödinger Equation and Schrödinger model of quantum mechanics. Although Schrödinger’s Cat is half-dead and half-alive, she is more alive than many in this musical and will live forever as an idea.
4. **QT4. Professor Marie Sklodowska-Curie**. Nobel Prize in Physics (with her husband Pierre Curie and Henri Becquerel) in 1903, Nobel Prize in Chemistry in 1911 (by herself). Inventor of radium and polonium, done fundamental work in radioactivity that influenced Relativity Theory (by Einstein’s own admission).
5. **QT5. Sir Isaac Newton (also plays Al Harizmi in act 4).** Newton created laws of motion and deterministic model of Universe that is now formally completely replaced by the Relativity and Quantum Mechanics theories but remains to be the main achievement of physics and natural philosophy. Arab-Persian mathematician **al-Khwārizmī (Abū ʿAbdallāh Muḥammad ibn Mūsā al-Khwārizmī**

Persian: الخوارزمی مو سی بن محمد عبد الله),introduced the concepts of algebra and algorithms and gave his name to them.

6. **PT1. Confucius in act 4 (also plays Richard Feynman in act 3).** Confucius influence is fundamental to Chinese culture and he was one of the greatest philosophers of all time. Richard Feynman pioneered quantum Quantum Electrodynamics, Quantum Computing and nano-technology. He enjoyed music and was also a master drum player.
7. **PT2. Charles Darwin in act 4. (Viking robot, also plays Alan Turing in act 3)** Darwin created the Darwinian Model of Natural Evolution that influenced many areas of science and is also used in robot programming. Father of Evolutionary Thinking. Alan Turing was instrumental to Enigma code breaking in Second World War saving millions of lives, created the first concept of a computer and contributed greatly to Artificial Intelligence, computer design and theoretical computer science. Father of Computational Thinking.

ROBOTIC ROBOT ACTORS (used only in the Futuristic Act 4)

1. **RT1. Golem of Prague** (a robot built by a Rabbi of Prague to protect Jews from anti-Semitic attacks, supposedly turned to be violent.)
2. **RT2. Brazen Head of Saint Albert the Great** (a robot built by Albertus Magnus, a great philosopher). Of particular interest to 20th-century music theorists is the attention Saint Albert paid to silence as an integral part of music. http://www.catholic.org/saints/saint.php?saint_id=144
3. **RT3. Monster of Frankenstein** (a robot built by a Dr. Frankenstein, supposedly turned to be violent.)
4. **RT5. Veribot the DIM Drummer** (a standard music-playing humanoid robot of the early twenty-first Century, built at PSU).
5. **RT6. Countess Quanta (used in acts 3 and 4)** (a hypothetical robot with quantum brain, see literature and Google under "Quantum Robot"). The theatrical prototype built at PSU in 2013.

Music should be composed (Edison Tsai) or selected. Please suggest melodies, slides, videos, pictures. I work on them separately but I welcome everybody's feedback.

Please email the lyrics of more songs with their proposed melodies to Dr.Perkowski. You can see from the text what kind of songs we need for this musical.

Narrator. Narrator is a voice from stage speakers and a text/pictures from associated slides. Slides are seen on a screed projected by a projector or on the large computer screen. Narrator is like a representative of the central controlling computer system of the theatre. Narrator is also like a teacher who teaches the audience about quantum mechanics, robotics and quantum computing technologies.

Act 1. Quantum Debate at Curie Laboratory, Sorbonne University in Paris, 1927.
Act 2. Quantum Physics Jam Session. In apartment of Marie Curie in Paris, 1927.
Act 3. Quantum Computing Laboratory at MIT, 2014.
Act 4. Quantum Consciousness Laboratory at PSU, 2180.

Props:

1. All audience is located on the corridor behind the glass window that separates the theatre (lab) from the audience located at the corridor. All Props should be visible by the audience. For instance, BackProp is a laboratory shelf with Curie equipment.
2. Front Curtain
3. Back Curtains
4. Slide Projector with a screen located on the upper part of the BackProp (or a computer screen).
5. Lights
6. Sounds from many speakers.
7. Fogg machine.
8. Other old-fashioned chemical/physical/radiation lab equipment from year 1927.

In Act 1 all robots are remotely controlled, but they have some preprogrammed low level behaviors (like in FTC). They will be also automated after gaining some experience. All songs and poems should be improved and respective music must be selected. Please suggest slides, videos, pictures.

STAGEPROPS

1. **RightProp is on the right.** It has Marie Curie robot half-sitting/half-standing on a raised desk (some kind of special lab equipment). The RightProp, like all Props is on dollies to be easily moved while changing the stage from act to act. Marie kicks her legs and mixes colorful chemical fluids, supposedly radiating (lights). She mixes flashy radiating chemicals in a big container located on the floor (may be with legs). She uses a spectrophotometer which she programs by pushing switches with her hand. She mixes fluids in test-tubes. There is a special mechanism that moves the body of the robot forward and backward (together with the whole RightProp). There are some large bottles of liquids behind her on the RightProp. In this play RightProp is used only in the first and second acts, next it is rolled out of the stage to make space for other robots. One computer using Aditya's Bhutada software (modified by Mathias Sunardi) controls RightProp, Marie Curie and Schroedinger's cat.

2. **WallProp** is a vertical wall from playwood on roller wheels. It has some support so it can stand on its own vertically, it becomes part of the Frankenstein's Monster arrangement together with the **MonsterProp** which is a wooden box of a medical vibrating machine that is connected to it. WallProp can be easily connected or disconnected from MonsterProp using large screws. A vibrating machine (**MonsterProp**) is composed of a lower part with motors and controlling electronics and an upper part. The lower part of **MonsterProp** looks from outside like some sophisticated old-fashioned research equipment. An upper part is a platform that vibrates in parallel to the wall (and **MonsterProp**). The **MonsterProp** is large and strong enough to carry any of our robots (including big

robots) located on the top of it. But in this play it is used only by Frankenstein's Monster.

3. **StageProp** is a metal frame (empty box) on wheels, composed of the upper part box (empty sides in the frame), the plane horizontal stage area on which robots move, and the lower part box (legs with frame). All these parts can be separated. Upper part and lower part can be used together. The stage area is used between the upper and lower parts (playwood or tabletops of office desks). Lights, cameras, and speakers are attached to the frame of the upper part. **StageProp** is on roller wheels, so it can be pushed to back, to right, to left, rotated 90 or 180 degrees, etc. It can be used as part of a complete stage design that includes the FrontProp, RigthProp, WallProp and MonsterProp, as well as other props such as furniture or speakers or lab equipment. In this play **StageProp** is in the back right of the stage and is not used much. It is used only in Act 3 and may be Act 4.

4. **BackProp** is a shelf on wheels that contains old-fashioned chemistry laboratory equipment. Its upper part contains a screen for projections. It is full of old-fashioned chemical and physical laboratory equipment, with some very early electronics like switches, amperometers and old cameras.

5. Lamps, lights, screens, pictures, speakers, little robots etc can be attached to each of the Props and natural walls of the stage (it means, my lab).

Act 1, first part. The interior of the stage in Act 1 is the Marie Curie's Laboratory at Sorbonne. Black courtain is all around, so the space is intentionally small. It includes only the BackProp, RightProp and some equipment, like the spectrophotometer and pipes from chemical distillation machine. Marie rotates so she is able to touch any piece of equipment to manipulate, with both hands and legs.

Act 1, second part. More space is available from the Curie Lab, more equipment is seen.

ACT 1. Quantum Debate

5 Robot actors in order of their appearance are:

1. **Professor Marie Sklodowska-Curie**
2. **Schrödinger's Cat**
3. **Professor Albert Einstein**
4. **Professor Niels Bohr**
5. **Sir Isaac Newton**

This column lists texts and general didascalia of the play	**This column lists slides with their numbers. Slides are all in a separate document**	**This column lists voice of the Narrator and other sounds that come from speakers**	**This column lists directions about lights and all additional equipemt**
Interactions are programmed separately. Each text of interaction is related to some robot behavior. For instance, following, avoiding, distance keeping, omitting to left, withdrawing, dancing around, attacking, etc. **Interaction 1.** To investigate variants of motions and behaviors of each robot.			*The concepts of behaviors, perceptions, motions and emotions are discussed in a separate document.*
	GOAL: *Introduction of Marie Curie, a great physicist and chemist*		*Lights go on.*
Marie Curie: *(Shakes little test probes, mixes them, creates new liquids. Uses Spectrophotometer. She looks at her lab and smiles happily.)* My lab. My love. Physics mixed with Chemistry. Like four elements of the ancient philosophy…. … Fire *(the fire of the bunsen changes from red to green),* ….water *(she mixes two fluids that change colors when mixed)* …. and earth *(she takes a piece of the uranium ore and raises it high with wonder in her eyes).* *(She contemplates and works, suddenly a strong wind blows at the desks raising material covers and making noise)* …. Yes, and air. Four elements, matter or energy? Transmute?			
Marie Curie: **(***Trembles on the machine)* Wind, it goes through walls of this shack. What a cold, walls are frozen. I have to spend here whole days to mix	**Slide 1.1***:* Laboratory of Marie Curie at Sorbonne in	**Narrator Voice:** *We are in the Laboratory of Marie Curie-Sklodowska at*	

and test my uranium ore to get a milligram of radium.	Paris.	*Sorbonne in Paris.*	
Marie Curie: *(Shakes her body to make herself warm) (she starts to sing, first shyly and quietly, it changes to a brave, bold, loud song).* You can think, you can learn, having the time of your life See that girl, watch that scene, look at the Science Queen. Friday night and the lights are low Walking fast to the lab to work Where the test-tubes shine, getting in the swing of research. She came here to look for a king Only one can be that guy Pierre was smart and bright and he loved her so. Lab smells with all liquids, the uranium ores shine You're full of brilliance And when you get the chance... You are the Science Queen, physics ace Nobel prize at thirty six, uaaaa…. science Queen, feel the beat from the tambourine You can dance, you can jive, having the time of your life See that girl, watch that scene, Nobel prize comes again, the Chemistry Queen *(She dances frantically with her both legs and arms, the whole body rotates and trembles, leaning down and up).* *(moment of silence, only noises of equipment).* **Marie Curie:** *(Speaks ironically)* A queen in a cold shack, with little money for her research.		Marie Curie , the Science Queen Melody of Dancing Queen from Abba, Text Marek Perkowski, please modify if you want and can We need the melody from Karaoke or so.	
(machine starts to make noises and stops, Marie manipulates with knobs, she gets angry, she kicks the machine and the machine starts again)			
Marie Curie:	**Slide 1.2:**		

(*Trembles on the machine)* So I invited them here…. Professors Albert Einstein and Niels Bohr have a never-ending debate about Quantum Mechanics and the essence of the Reality. They are coming in a moment but I am not ready *(looks to a mirror and checks her beauty in a womanly fashion).*	Professors Albert Einstein and Niels Bohr have a never-ending debate about Quantum Mechanics and the essence of the Reality.		
To present the character of proud mischievious cat and introduce characters and their behaviors.	**GOAL** Unruly Cat in a Chemistry lab		
(door bell rings) **Marie Curie:** Oh, they are coming….			
Schrödinger's Cat: (*enters, sings to himself*) we are in Heaven, Heaven (*on the melody of Ella Fitzgerald and Louis Armstrong "I am in Heaven").*	**Slide 1.3:** Schrödinger cat half dead and half alive from physics books.	Schrödinger's Cat looks a little bit like a little Einstein with mustache	
Schroedinger's cat introductory song I'm in heaven And my heart beats so that I can hardly speak And I seem to find the happiness I seek When we're here together speaking bout physics Curie lab, We are in heaven Einstein, Bohr and Marie around me for weeks I do not know the year, I don't count time leaks When we're debating quantum mechanics			
Schroedinger's cat *(He sees the public).* *(Gestures)* meow, *(waves with one hand to audience).* **Marie Curie:** (*rotates upper body towards the audience*) This is a cat of Professor Schrödinger. I hate this cat! (*she kicks the cat with her leg when he comes too close*) He always pisses secretly to my chemical tanks.			

He idolizes and loves Einstein and even dresses like him.			
Marie Curie: (to the Schrödinger cat) znikaj stad natychmiast ty cholerny kocurze.	***Slide 1.4:*** *In English Translation from Polish.* Disapear you bloody cat.	**Voice of Narrator.** *When Professor Marie Sklodowska-Curie gets excited she switches to Polish.* *She just said:* Disapear you bloody cat.	*Lights on Curie*
Schrödinger's Cat: *(not paying attention to Curie who quickly gives up on throwing him away)* Hi, everybody …(*meows, waves with one hand*) I am Schrödinger… eh, eh (*coughs, covers his mouth with hand*) Sorry, I am Professor Schrödinger, (*caughs and covers mouth again)* I mean, I am Professor's Schrödinger's Cat. (*with strength*) Cat. Schrödinger's cat, for short. (*smiles broadly*) You may have heard about me, I am sure, since I am a very famous cat. (*smiles, pushes his hands down to lean back*) But this is the first time that I have a chance to talk to American teenagers. (*greets everybody with enthusiastic body gestures again*). Hello, Hellooo! (*like in Hollywood or Disneyland*). *(bell rings again)* **Schrödinger's Cat:** Ah, here they are at last. (*as introducing wrestlers to the ring).* The two greatest physicists in the world- Professor Albert Einstein (*Einstein robot waves both hands, smiles broadly, jumps up and down, dances around.*),	***Slide 1.5:***		*Lights on Cat*

Professor Niels Bohr (*Bohr robot makes greeting gestures with head and hands, like a professional wrestler*), **Schrödinger's Cat:** It was the two of them that came up with the basic laws that govern all objects in the universe. **Marie Curie:** (*Moves and trembles nervously as not mentioned by the cat as one of the top physicists.)* **Schrödinger's Cat:** *(finally paying attention to Curie)* … and Maria Sklodowska –Curie, the first scientist in the world who got the Nobel Prize twice. In Physics, and in Chemistry. A woman…. **Marie Curie:** *Moves and trembles with hands and legs, kicks instruments in happiness.* **Schrödinger's Cat:** *(showing towardsfinally Curie)* … and Maria Sklodowska –Curie, inventor of radium and polonium, the concept of radioactivity that led to revolution in physics and several theories in relativity and quantum mechanics. The first scientist in the world who got the Nobel Prize twice. In Physics, and in Chemistry. A woman…. (*Newton robot enters*). **Marie Curie:** (*frightened*) Newton's here? How did you….? I am an avid atheist.…..What? **Newton.** *(recites rhythmically, with pride)* I live out of time and space, I live here and there, I am present everywhere. I am mind, I am aethernal.	***Slide 1.6:*** Isaac Newton		
Lights go off. The curtain is shifted from the left of the audience to the center making space of the whole lab seen to the audience.			

End of part 1 of act 1.			
A young girl comes dressed in Indian Costume, bows and shifts the courtain to make more space. The girl is Chinese.			
Another young girl comes dressed in Korean Costume, bows and rolls the RightProp to a new place. The girl is Indian.			
One more young girl comes dressed in Polish or German Costume, bows and rolls the BackProp to a new place. The girl is Chinese.			
Part 2 of act 1.	Fight of Newton, Cat and Einstein		*Newton, Bohr and Einstein are programmed in one piece of hierarchical software, the same as Marie Curie and Cat are. The same software controls also lights and all laboratory equipment.*
Interaction 2. *Switching randomly between behaviors: (a) Newton attacks in wheelchair , Einstein keeps distance, (b) Einstein attacks, Newton keeps distance. All initial and additional space is used for robots chasing one another, escaping, fighting and dancing without music with their bodies.* **Schrödinger's Cat:** (*with nearly hysteric emphasis, to the audience)* It was Einstein and Bohr that came up with all the laws that govern the universe. **Newton:** *(to Schrödinger's cat)* What do you mean? I thought that *I*, Sir Isaac Newton, developed the laws that govern all objects in the universe! You don't mean to tell me- (*Newton speaks in British accent, in a very slow and distinguished fashion*).	***Slide 1.6:*** Isaac Newton ***Slide 1.6A:*** Albert Einstein		

Einstein: *(to Newton)* You fool! *(Einstein looks angry, jumps up and down towards Newton. Newton is much taller than Einstein)* You, who claim to be better than all the rest of us, who claim that you are alone out of all the great people in the world, do not even realize the simple behaviors of relativity …. **Schrödinger's Cat:** (*interrupts Einstein*) ….and basic quantum mechanics! *(smiling goofily)*			

Newton: *(to Einstein, ignoring the cat)(arms crossed)* I beg your pardon!. I -			
	Bohr is nice and concillatory to Newton		
Interaction 3. Newton follows Bohr. Bohr attacks from left and right. Omits when too close. Randomly follows Newton. **Bohr:** *(holding out arms, looks calm)* That will do! Sir Newton, calm down. And Einstein, you know as well as I that Sir Newton was not born at the time that the both of us discovered these two theories, therefore he could not know them. As for you, Sir Newton, please understand that you lived in an era at which time the science and technology were very limited, and so you do not have the complete picture of how the universe works	***Slide 1.7:*** Bohr disputes with Einstein, famous photo		
Newton: *(looks shocked, arms unfold, addresses the room at large)* But…but that's preposterous! I found hard, solid evidence for my three main laws and the existence of gravity. You can read it all in my book. You don't mean to tell me that all the tests and experiments I and	Slide projector displays physical formulas, diagrams and names corresponding to their theories.		

others before me did were completely -! **Bohr:** *(calmly)* No, we don't mean to tell you. Your laws work perfectly if you're working with a certain size. But, when you look at things in the subatomic level, then that's a different story. You see, in the years after you died, we discovered that it actually is possible to break down the atom-	***Slide 1.8:*** Einstein Relativity Theory ***Slide 1.9:*** Bohr Atom Model ***Slide 1.10:*** Bohr Quantum Atom Model		
Newton: *(confused, eyes narrowed)* What in the name of- **Bohr:** *(To Newton)* The atom is the smallest particle that can exist by itself. It is so small that earlier philosophers thought that it was indestructible- **Newton:** *(To Bohr)* Well, if it is so tiny, how on earth did you manage to- **Bohr:** *(To Newton)* It is enough that we managed it. It is not in fact, indestructible. Now…	***Slide 2.10:*** Size of atom versus human		
Marie Curie: Thus we can change one atom to another one. My radiation experiments…. *(interrupts, plays her drums).*	***Slide 1.11:*** Some work of Marie Curie		
Einstein: you know, we need some music now. I will play my violin, you Mary will play your all instruments and you (*turns to cat, Newton and Bohr*)…., I do not know. So, let's visit Dr. Curie's salon.			
Curie: …. I was not prepared….. **Bohr:** Do not worry, we bring the food.			
They all depart the stage in good mood.			

ACT 2. Quantum Physics Jam Session

5 Robot actors in order of their appearance are:

1. **Professor Marie Sklodowska-Curie**
2. **Schrödinger's Cat**

3. **Sir Isaac Newton**
4. **Professor Niels Bohr**
5. **Professor Albert Einstein**

Act 2. Curie's Salon. The walls are decorated with 1920's European furniture and paintings on walls. German, Austrian, Danish and British style lamps and lights. See slides. This place is a hybrid of Paris salon from the twenties of twenty century, and a Physicists' Heaven where there is no time, no space, and only mathematics around. Some oriental, especially Chinese paintings and items that were fashionable at this time. Some ikebana and flowers.

A young girl comes, curties and shifts the courtain to make even more space. She rotates the BackProp and does some other space arrangements. In this musical humans only move and gesture. They do not speak. They are completely silent. The emphasis is on robots.			
Interaction 2.1. **Marie Curie.** *She plays various musical instruments with her hands and plays percussion instruments with her both legs. Marie switches from one percussion instrument to another. Plays piano after rotating her whole body.* *Einstein plays violin.* *Bohr plays piano and Newton dances.* *Cat is the central figure. Dances and sings.* *Newton is afraid of the cat that attacks him from time to time, he keeps distance from the cat.* *If not occupied with eating, he follows any close robot.* *Bohr keeps constant distance from cat but explores around.* *Newton does the same.* *Bohr follows random robot. Omits when too close. They all seem to dance together.*	***Slide 1.12:*** *Another picture of Schrödinger cat.*		

Schrödinger's Cat *sings:* A lively little quantum 7 went darting through the air, 6 Just as happy quanta 6 go speeding everywhere. 6 He traveled far -- this quantum 7 -- urged as if by a call, 6 When he saw a lonely atom 8 with no signs of pep at all, 7 And he started for that atom 9 in the highest of elation, 8 Said he: "Here's where I show 6 the trick of transmutation. 7 I'm going to hit that atom 6 such an awful, awful whack, 8 That I'll knock out its electrons 8 so far they can't get back." 6 So he gave that peaceful atom 8 such an energetic shove, 7 That its outermost electrons 8 soared to levels far above. 7	***Slide 1.13:*** Atoms. Ions, electrons and quantum effects	*Found on internet, no melody known*	
Marie Curie and Schrödinger's Cat: (*sing together and dance*): Then the atom got excited, and held the quantum fast, Until the last electron came tumbling back at last. Then the quantum was released, and fled in degradation, While the atom got the credit for a lot of radiation. *(Marie plays drums).*	***Slide 1.14:*** Atoms and radiation.		
Bohr: *(to cat, mockingly)* Thank you. *(to Newton):* As I was saying, at this level, your laws don't seem to work that well. This requires a different branch of physics to explain, and that is why I am sitting here, because I, and some others like Schrödinger and Heisenberg discovered a set of laws, dubbed quantum mechanics, which applies to how particles behave at the subatomic level. Atoms can change ***into*** other atoms, and the behavior of particles is probabilistic… **Einstein:** *(enters the room and hears this)* *(Angrily, jumping up and down)* I beg to differ! God does not play dice***!***	***Slide 1.15:*** *Heisenberg Uncertainty Principle or Quantum Measurement and probability.*		

Schrödinger's Cat: *(Sighing theatrically)* Einstein, Einstein, stop telling God what to do! **Bohr:** (*Impatiently, to Einstein and Schrödinger's cat*) Yes, yes, we get it. But this is not the time for contradictions. We must first explain to Mister Newton why we are sitting in this laboratory with him. (*To Newton*) Anyways, quantum mechanics explains how subatomic particles behave.	***Slide 1.16:*** *God playing Dice*		

Interaction 2.2. *Cat is occupied with himself. Dances and sings, but not in center.* *Newton communicates with Bohr.* *They both keep distance.* *Never bounce, come close and go apart again.* *Einstein turns or drives always to the person who talks but keeps distance.*	***Slide 1.17:*** Einstein, Newton, Bohr, Schrödinger or some other famous physicists		
Bohr (*continuing*) Also, Einstein here- **Newton:** What, this ***idiot***? **Einstein:** (*opens mouth in anger*) Ehh.! **Schrödinger' Cat:** Yes, yes, Professor Albert Einstein (*points to Einstein*) here has discovered laws that govern very large objects, such as stars.	***Slide 1.18:*** Einstein with tongue out, famous photo.		
Newton: What? Doesn't gravity- **Einstein:** (*patronizingly to Newton*). Yes, it does. In fact, gravity does more at the cosmological level than even you had predicted. However, according to Professor Schrödinger, her owner (*points to Schrödinger's cat*), it does not have as big a role at the subatomic level.	***Slide 1.19:*** Newton gravity and relativistic gravity		

Interaction 2.3. *Cat and Einstein in intense communication.* *Newton tries to break in. They all keep distances.* *Never bounce, come close and go apart again. The robot vision software prevents the robots from any*	***Slide 1.20.*** Einstein and Schrodinger Cat		

collisions, despite fast and chaotic motion of all of them.			
Schrödinger's Cat (*meows and bows with deep satisfaction of being mentioned*).			
Einstein (*not paying any attention to the cat or anybody else, continues*) However, contradictory to what you might have been expecting, the universe is expanding, as in, all the galaxies are moving apart so rapidly that you can see it on a telescope. Another force, dark energy by name, pulls the galaxies apart more rapidly than gravity can pull them together. I have discovered that space and time together form a four dimensional space. I have called this spacetime. Think of spacetime as a rubber sheet. When you place a large object, such as a star, on spacetime, it is like putting a large ball on a rubber sheet.	***Slide 1.21.*** Dark Energy, Space time		
Schrodinger's Cat: (*frightened*) I hope he does not want to make me this large object. I remember when Professor Schrödinger last time put me to a box…	***Slide 1.22.*** Some new cruel experiment with a cat.		
Einstein: (*to the cat*) You are not a star. Thus…, wait, what did I say?. Aha. (thinks to remind himself) The object makes a dent in the rubber sheet, and the paths of passing objects, such as planets, will change because of the dent. This is a basic model for gravity, and it is why the earth revolves around the sun. Now, because of gravity's influence on spacetime, gravity can actually slow time around a large cosmological object such as a star. Evidence also shows that light will bend when passing through a gravitational field.	***Slide 1.23.*** Gravity and spacetime		
Interaction 2.4. *Newton and Bohr come close.* *They seem to dance forward and backward, coming close and dancing around.* *Cat tries to be involved in their interaction.*	***Slide 1.24.*** Atom inside		
Newton: (*To Bohr*) Interesting. And why do my laws not work for the very small, mister…			
Bohr: (*to Newton*) And, when we say small, we mean extremely small.	***Slide 1.25.*** Atom and		

Objects far smaller than the ones you have ever tested. You see, with our new advances in technology, we have created probes and microscopes so powerful that we can see the individual atom itself. What we have seen confirms theories made long after your time. Firstly, unlike the first atomic theories, we have discovered that the atom is not, in fact, indestructible. The atom is made of three elementary particles: the electron, the proton, and the neutron. Now, the proton has a charge of positive one, and the electron has a charge of negative one, and the neutron has no charge at all. We have created large particle accelerators that can break apart protons and neutrons-	microscope or something similar.		
Newton: *(Astounded, to the audience at large)* You don't mean to tell me that even protons and neutrons are-	***Slide 1.26.*** Grand Particle Accelerator from CERN		
Schrödinger's Cat: Yes, we do mean to tell you.			

Interaction 2.5. *Newton remains still in the middle of the stage. Einstein and Bohr come close. They seem to dance forward and backward, coming close and dancing around. Cat tries to be involved in their interaction.*	***Slide 1.27.*** Painting of Newton looking like idiot		
Einstein: Newton, you are the stupidest physics professor I have ever met! I have even to explain you what a computer is. I think that you ought to replace your head.			
Newton: *(repeats in a frightened voice, uses arms and hands to protect himself from Einstein's aggression.)* I am clever, I am an Oxford professor. I am a Master Warden of the Mint of His Majesty the King of England, I am…			
While Newton multiplies his royal titles and achievements, a very young live student, a little			

girl, walks in and curtsies theatrically to the audience.			
She goes to Newton and tries to reach his head. It is too high.	***Slide 1.28.*** Painting of a man changing head of a robot or another man.		
She bows low to the public in an Asian style			
She comes back with a little ladder and puts it near Newton.			
She goes back and comes back with a big hat on her head. She removes new Newton head from the hat and puts it on the body of Newton.			
She curtsies theatrically last time and leaves the stage.			
Newton: *(for a while he does nothing.* *Then shakes body enthusiastically.* *Then he shouts in a youthful energetic voice)* Now I understand everything, even the computers of Doctor Turing. I am clever now.	***Slide 1.29.*** Young Newton and Young Turing with Turing Machine		

Interaction 2.6. *Newton stands still in the middle. Einstein and Bohr come close. They seem to dance forward and backward, coming close and dancing around. Cat tries to be involved in their interaction.*			
Bohr: (continues). So, what was I saying? Ah, yes. When we died, some physicists theorized -			
Newton: How do you know it if this happened after your death? **Cat:** (*together*) The Internet. I will teach you how to use it. If you do not understand Internet, Newton, think about God. Internet sees everything, knows everything about you, is benevolent and does you always good. (*Newton is amazed*).	***Slide 1.30.*** The Internet ***Slide 1.31.***		

Bohr: (continues). The protons and neutrons are clumped into a tiny ball at the center of the atom, called the nucleus. Now, you might wonder, how are two positively charged protons clumped together so tightly in the nucleus? **Newton:** I know that! Now stop treating me like I am five years old, and asking me stupid questions! I am a physics professor, you know, and I know very well that strong nuclear force holds protons together! **Bohr:** (*affronted, mocking*) Well, excuse me.	Protons and Nuclear Forces		
Einstein: (*Muttering*): Hm. It seems as if he really has changed his head! **Newton**: (*Snottily*): Don't be silly! How could I have changed my head? You know, in order to change your head, you have to either remove your head and put on another one, which is impossible because you would die first, or you would have to have on two heads at once, and let's face it, no one can have two heads at once- however, and electron could be in two places at once-	***Slide 1.32.*** Photo of very surprised Einstein		

Interaction 2.7. *Newton dances quickly in the middle. Einstein and Bohr dance around him. Cat dances forward and backward, coming close and dancing around. Cat and Newton try to be involved in Einstein/Bohr interaction.*	***Slide 1.33.*** Schrödinger Cat State - superposition		
Bohr: slaps his forehead with his hand **Einstein:** (*losing control*) SHUT UP! **Schrödinger's Cat:** I ***not only*** can be in two places at once, but I can be even dead and alive at the same time.			

Newton: (*laughs*) but that's impossible! **Bohr** (*continues*). Well, you know, according to the principle of indeterminancy, anything is possible, and nothing can be predicted by the laws of physics. *(Schrödinger's cat starts to get bored)* **Newton**: Well, you have a point, but that only predicts the position of atoms or electrons- (*Schrödinger's cat falls asleep and snores loudly every once in a while)*	***Slide 1.34.*** Heisenberg Principle picture		

Interaction 2.8. *Einstein dances in circles in the middle. Cat, Newton and Bohr dance in line around him. Cat however dances forward and backward, coming close and dancing around. Cat and Newton try to be involved in Einstein/Bohr interaction by random motions from time to time towards Einstein. Cat falls to sleep and is awaken from time to time.*	***Slide 1.35.*** Measurement of Cat State together with God playing dice.		
Einstein: (*Angrily, pointing at Bohr*) Here's where I don't believe you two. It cannot be that there are absolutely no laws governing the electron, that it can be anywhere. There must be something systematic! God does not play dice! **Bohr:** *(to Einstein, with bored expression)* Yeah, yeah. **(***to Newton):* Professor Einstein's frustration is understandable. The idea behind quantum mechanics is extremely strange, certainly-			
Einstein: Strange, ugh. (*to the audience*), let me give you an example of the full picture of quantum mechanics. (*he is truly mad*). You see, the atom consists of the nucleus and the electron cloud. Now, if the nucleus of an atom were the size of a poppy seed, the rest of the atom would be larger than a palace. **Newton:** I know that! **Bohr:** (*irritated*) He wasn't talking to you, he was talking to the audience. **Einstein:** As I was saying, the atom is mostly empty space. Now, according to quantum theory, the nucleus could be	***Slide 1.36.*** Nucleus and the electron cloud.		

anywhere inside the atom. Just think about it. This means that an atom can pass right through another one, because the empty spaces can line up. So, according to quantum theory, it is possible for us to walk straight through a wall. Although the chances are miniscule, it is possible that the nuclei of the wall and the nuclei of our body never touched if we walked at the wall. So, how can you simply call this 'strange'? Quantum mechanics is like gluing an elephant, a gorilla, a snake, and a horse and calling it the finest creation of evolution.			

Interaction 2.9. *Bohr stands in the middle. Cat sleeps and snores. Newton and Einstein dance in line around him, forward and backward, coming closer and further apart. Newton tries to be involved in Einstein/Bohr interaction by random motions from time to time towards Einstein. Bohr is angry and excited.*	***Slide 1.37.*** Offended cat.		
(Schrödinger's cat wakes up suddenly) **Schrödinger's cat:** (*Looks at Einstein in a comically offended expression, points at himself)* I am insulted! **Bohr:** (*complex, weird*) though the idea undoubtedly is, it has been proven several times. We even have a picture of the electron in two places at once!			
Newton: (*raises a finger*) Well, technically- **Bohr:** SHUT UP! **Einstein:** (*Angry*) So what? How do you know that that other electron wasn't just an escaped piece of beta radiation? According to you- **Bohr:** (*Also angry*) Do you know how small the chances of that are?	***Slide 1.38.*** Bohr, Einstein and Newton arguing.		

Interaction 2.10. *Cat is extremely excited. Dances and makes gestures towards other robots. Bohr in circles in the middle. Newton and Einstein dance in line around him, forward and backward, coming closer and further apart. Newton tries to be involved in Einstein/Bohr interaction by random motions from time to time towards Einstein. Bohr is angry and excited.*	***Slide 1.39.*** Some funny photo of a cat	**EPR experiment and entanglement**	

Schrödinger's Cat: (*wearily, asks for silence with his gestures*) Now, now, don't fight professors. *(to audience)* I tell you. I truly love these physics professors, although they do mistreat me. (*talks to teenagers in the audience*) … and you? I love physics. And you? (*to audience*). (*sings and dances*)			Depending on the answer of the audience "yes" or"no" the cat can add some didactic talk about physics
Schrödinger's Cat: *(to professors).* And now, I will tell you about the Einstein-Podolsky-Rosen experiment.	***Slide 1.40.*** Einstein, Podolsky, Rosen paper and Entanglement		
(Sings) Two photons, close-coupled at start, Flew several parsecs apart. Said one, in distress, "What you're forced to express Removes any choice on my part." **Bohr:** "Electrons all jumbled like rice?" Quoth Einstein, "That's too high a price." In reply, answered God "Well I don't find it odd. So shut-up and let me play dice."			

Interaction 2.11. (terrible life of Schrödinger's Cat):	**SLIDE** ***Slide 1.41.*** A terrible life of the Schrödinger's Cat	**Narrator's Voice** A terrible life of the Schrödinger's Cat	
Schrödinger's Cat (*turns to audience*): Well, that's what the discussion of the three greatest physicists ever to exist would probably be like. Clearly (*gestures at Einstein and Bohr*) there are still issues that remain to be solved in the world of physics.			Light on cat

You will hear from us soon, and now please ask me ***questions***, ***for I am*** the famous Schrödinger's Cat, about whom have you heard. You may also ask questions to these … professors,…, if you wish to. But first I will tell you my sad story, about which you will hear more soon.			
Schrödinger's Cat (*sings and dances*) You may have read about the Schroedinger's cat, the Schroedinger's cat None of the cats in the whole world is like that, is like that. Schroedinger cat. Cat. **Marie Curie:** (*dances and plays drums and other instruments*) He is truly unusual scientific cat (so it can be said) He is simultaneously alive and dead! Alive and dead. Ehh. **Marie Curie:** (*dances and plays her percussion*)	***Slide 1.42.*** Schrödinger Cat tortures.		
Newton: (*sings*) What I don't understand is just why he Can't be one or other, unquestionably.	***Slide 1.43.*** Eigenstates and Eigenvalues of a matrix		
Schrödinger's Cat: (*sings*) My future now hangs in between eigenstates. In one I'm enlightened, the other I ain't.			
Einstein: (*sings and dances*) If you understand, then show him the way And rescue his psyche from quantum decay.			
Einstein: If you care about animal rights, Consider the horrible plights, Of Schrödinger's cat, And others like that, For many long days and nights.			
Bohr: (*sings and gestures with hands rhytmically*) But if this queer thing has perplexed even you, Then I will and won't see you in Schrödinger's zoo.			

Newton: ***(****to Einstein****)*** Can we use quantum to build a computer? **Einstein:** Sure, to learn how, you will be now teleported to an amazing place. Just have your eyes wide open.	***Slide 1.44.*** A computer		
Marie Curie: *plays instruments and sings. Occasionally kicks legs.*	***Slide 1.45.*** Some stuff of Curie Sklodowska in Poland		**Fogg Machine: All robots** disappear in fogg. **Lights** are dimmed.
Lights go off. *Students come and silently move Props, changing the stage to MIT lab.*			

ACT 3. QUANTUM COMPUTING AT MIT

Act 3. MIT Lab with center stage StageProp where quantum computing experiments are done. StageProp is symbolizing the Hilbert Space to which the robots can be teleported. Year 2014.

Space of the Portland Cyber Theatre. The location of robots are changed. No Marie, no Frankenstein Monster, No DIM. Whole stage available. **Hilbert Space in the middle.**

7 Robot Actors in the order of their appearance:

1. **Countess Quanta** genius robot-physicist, inventor of Quantum Consciousness idea. A mysterious figure that travels in time and space between various universes and realms of existance.
2. **Schrödinger Cat.** Already working in the MIT lab
3. **Sir Isaac Newton,** already known to us. Visiting the MIT lab. **(also plays Al Harizmi in Act 4)**
4. **Professor Albert Einstein** Visiting the MIT lab
5. **Professor Niels Bohr** Visiting the MIT lab
6. **Richard Feynman,** inventor of quantum computing, quantum electrodynamics and nanotechnology, the spirit director of the lab. This role is played by robot **Confucius** from Act 4.
7. **Alan Turing**, father of computing and Artificial Intelligence. It is played by Viking robot who also plays Darwin in Act 4.

	Slides ***Slide 3.1.*** 1. We are at the Massachusetts Institute of Technology. **2.** In a top 21st Century Quantum Computing Laboratory	**Narrator** **Sound** We are in top 21st Century Quantum Computing Laboratory	
		(scientific music like in science fiction movies).	
*We see Countess Quanta and Schr**ö**dinger Cat doing some experiments.*			
Einstein, Bohr, Newton *(roll in from the middle entrance, the corridor from the main robotics PSU lab)* **Countess Quanta and Schrödinger Cat** (*look at Newton and move around him*). **Newton** *(surprised looks around)* Where am I? **Schrödinger Cat**: You are in…. **Countess Quanta** *(takes the role of a guide and host)* … in MIT Quantum Computing Laboratory. (*bows and greets*)	***Slide 2.2.*** Feynman, Fredkin and Toffoli in MIT lab.		
Feynman. (*appears from darkness*) … And more precisely, we are in Hilbert Space. This metal box here is a Hilbert Space in which there is no decoherence.	***Slide 2.3.*** Hilbert Space. Feynman, Countess and Turing in MIT lab.		*When Feynman tells these words all lights of the cage mysteriously blink*
Newton: My name is Sir Isaac…… **Countess Quanta:** Yeh, yeh, we know you. You look familiar. **Turing:** Hi, Newton. I am Turing, and this is Rick Feynman (*points to Feynman*).	***Slide 2.4.*** Decoherence		

Feynman: We have some accomplishments in quantum mechanics and reversible logic (*bows*) and… **Turing** … logic and computing. But now we work as quantum scientists. We hired also the cat the formerly belonged to Dr. Schr**ö**dinger. **Turing:** Smart guy, and he has a great sense of humor. **Feynman:** Outside of the box there is a normal space that you, Newton, invented.			
Countess Quanta: But being in this box we have a different Universe. Here the rules of Quantum Mechanics rule. If we measure you, you jump randomly outside the Hilbert Space. To some deterministic state, that you so believed in and liked. **Newton:** No, no, please do not measure me. I want to stay with you guys in Hilbert Space.	***Slide 2.5.*** Quantum Universe		
Newton: So what are you studying here, sir Toffoli,…. Sir Turing, Sir Feynman…., and, and, how should I call this? *(points to Countess Quanta).* **Feynman:** (*all respond quickly*) Teleportation. **Turing:** Superposition. **Countess Quanta:** Entanglement. **Turing:** Quantum Machine Learning. **Feynman:** Quantum Control. **Turing:** Axiomatic Quantum Morality. **Countess Quanta:** Quantum Econometry. **Turing and Feynman together:** (*with great emphasis*) Quantum Artificial Intelligence. **Countess Quanta:** Quantum Consciousness.	***Slide 2.7.*** Teleportation. Superposition. Entanglement.		

Newton: (*points to Countess*) And who is this ugly woman? *(demands an answer)* **Turing:** She is not ugly, she is as we say, differently beautiful. (*bows to the robot*) Her majesty Countess Quanta? Professor Newton. (*keeps explaining*) Countess Quanta works also as a Hadamard Transform. She actually transforms you to Hilbert Space. If you are in zero state, she, as a quantum gate, will change you to a Cat State, equal superposition of two distinct states, like happy and unhappy. **Newton**. Oh, I remember, there was a Schr**ö**dinger Cat that I met. **Countess Quanta:** You are right, we named this quantum state after him and… I hired him. **Turing:** This lab gives us a lot of freedom.	***Slide 2.8.*** Hadamard Gate creates superposition		
Countess Quanta*: (comes close to Newton)* Can I marry you? **Newton:** No…. (*freightened, gestures her to go away*). **Countess Quanta:** Why? **Turing:** Why not? **Newton:** Because I mean traditional marriage …. and … you are a robot. Besides, I prefer blondes. **Countess Quanta: (***Makes dramatic gestures with hands and body).* *(approaches Bohr)* Can I entangle my qubits with your qubits?	***Slide 2.10.*** Wedding ceremony of robots.		

Bohr: Yes, certainly.			

Schrödinger's Cat: (*sings and dances*) ***Slide 2.11.*** History of physics

In- the- be-gin-ning (5)
There- was- A-ris-to-tle (6)
And objects at rest (5)
Re-mained –at- rest (4)

But –those-in –mo-tion (5)
Thought –that- the- rest- is- ***best***. (6)
So God was bored, (5)
Although -***full –of -rest.*** (4)

Schrödinger's Cat: *(to professors)*. Gentlemen…

Newton: (*sings and dances*)

Then God created Newton
And objects at rest remain***ed*** at rest
And objects in motion remain***ed*** in motion
And energy was conserved, and momentum was conserved,
And matter was conserved
And God saw that it was conservative.

Einstein: (*sings and dances*)

Then God created Einstein
And everything was relative
And fast things became short
And straight things became curved
And the universe was filled with inertial frames
And God saw that it was relatively general
but some of it was especially relative.

Bohr: (*sings and dances*)

Then God created Bohr
And there was the principle
And the principle was quantum
And all things were quantified
But some things were still relative
And God saw that it was confusing.

Schrödinger's Cat (*approaches Countess Quanta***):** You know, Countess, I am bored, we have only to follow their experiments, even we know so much and can invent on our own. **Countess Quanta.** Or even better…. **Bohr:** And they only dance instead of working. These professors need a better work ethic. **Schrödinger's Cat:** Let us escape from here, guys. Do they have this quantum tablet thing? **Countess Quanta**: No, we have to invent it. **Bohr and Countess Quanta:** We want to build our own Quantumly Conscious beings. **Schrödinger's Cat:** How can I learn about the Quantumly Conscious Robots and tablets?	***Slide 2.12.*** Quantum Tablet		
Countess Quanta: According to my knowledge, you have to go to Portland State University. Come with me, please. **Bohr** and **Schrödinger's Cat:** Let us go there. **Countess Quanta**: Too early, we have to wait until year 2180. **Feynman** (*approaches, as he hears their conversation*): No problem, the quantum time can flow freely forward or backward. But please remember, the Department name is Electrical and Computer Engineering. Hahaha… (*smiles jokingly*). **Einstein**: Let us enjoy music and dance.	***Slide 2.13.*** Portland State University. Every University playing this play can change the name to their name.		

(*dances, improvises*). **All robots** *dance,* **Schrödinger's Cat and Bohr:** *leave the stage silently.*			
Einstein (*to Countess Quanta, Bohr and* Schrödinger's *Cat*) I will join you guys later when I will learn more about quantum computers from these guys.	***Slide 2.14.***		

Stagebots changed. Whole area available.

ACT 4. PSU QUANTUM CONSCIOUSNESS LABORATORY, YEAR 2180.

Act 4. PSU Quantum Consciousness Laboratory – actual our Portland Cyber Theatre stage of our Intelligent Robotics laboratory as it is now, with four new strange robots. Futuristic equipment for entanglement and teleportation in time and space. This is the largest space seen by the audience of this musical. All curtains are raised or shifted out. Big Props are shifted to sides. For details, see special plans that will be given in a separate document.

11 robots in the order of appearance:

1. **Veribot the DIM Drummer**
2. **Monster of Frankenstein with his fishes**
3. **Charles Darwin.**
4. **Confucius**
5. **AlHarizmi,**
6. **Countess Quanta**
7. **Golem of Prague**
8. **Schrödinger's Cat**
9. **Bohr**
10. **Einstein**
11. **Brazen Head (Head of Saint Albert the Great)**

Robots	**Screen**	**Sound**	**Lights**
Explanation of differences			

among Quantum Mechanics (Schrodinger, Einstein, Bohr, Heisenberg), Quantum Computing (Feynman, Deutsch, Toffoli, Fredkin, Grover, Lloyd), and Quantum Consciousness (Penrose, Hameroff) will be given in a separate document that is in preparation. Hopefully one can enjoy this musical even without a deeper explanation.			
	Initially Black stage. Slowly we recognize PSU engineering buildings and interiors	**Sound** mysterious music	**Light** first nearly dark, grows in intensity.
Veribot the Drummer plays drums.	**Slides of** Portland State University ***Slide 3.1.*** 1. ***Slide 3.2. TEXT:*** We prepare students for successful careers and lifelong learning in engineering and research through knowledge creation, technology development, and innovation. ***Slide 3.3.***	**Sound Voice:** Portland State University Maseeh College of Computer Science	**Light** shows robots and equipment
Veribot the Drummer (*plays drums).* Yeh, Yeh. They prepare students for successful careers and lifelong learning in engineering and research through knowledge creation, technology development, and innovation.	**More slogans from PSU**		
Fishes *(on the flower-covered wall of BackBot)* *Fishes sing and move in turn.*			
Frankenstein's Monster *(sleeps and snores. Is awaken by the fish. Starts to move slowly in a dignified way, as awaken to a new life after centuries of non-existence)*	***Slide 3.4.*** ECE Department.		Lights point to two little iSOBOT robots of Qubit and Qubot on the

What? Where am I? Strange space? Fishes talk? (*he is surprised*) It cannot be. Am I drunken? Is it a fairy tale? Master Frankenstein always amazes me. Why he wants fishes? Where is he? *(moves in pendulum way forward and backward, first quickly, then motion slowly disappears)*			laboratory table
Light on Darwin			
Light on Confucius			
Light on al-Khwārizmī			
Darwin Since our dear Master left us, life is boring without experiments and brainstormings. **Confucius:** Yes, but she will be back. She traveled back in time to get some information from Alan Turing. **al-Khwārizmī:** Amazing, in my times the women did not… **Darwin**: In my times, also,… but she is a woman… robot. She evolved in quantum evolution, not in Darwinian evolution. **Confucius:** She started this lab that we are now. It was her fundamental papers about quantum robots and quantum consciousness that changed the entire areas of Quantum Computing, Artificial Intelligence, Machine Learning, Biology, Psychology and robot building in the twenty-second century.			
Darwin, Confucius and al-Khwārizmī (*They slowly dance, play guitars and sing*			

sad songs).			
From the corridor at the back of stage Countess Quanta comes with Schroedinger Cat and Bohr. **Darwin, Confucius, al-Khwārizmī** , **Frankenstein Monster , Veribot the Drummer** *(all become very excited and behave like happy children)* **Countess Quanta** (*looks with surprise around*) But… nobody works here. Everybody celebrates only…	***Slide 3.5.*** Robotics Lab		
Lights are dimmed. Suddenly a loud music is heard, many young voices.			
Frankenstein Monster. (*explains enthusiastically*) We do not work because… **Golem:** … we have a graduation ceremony today.	**Video** of student graduation ceremony from 2011. Faculty play guitars.	**Sound of Video** of student graduation ceremony from 2011. Faculty play guitars.	
	Video with Jay Penev and PSU Professors and stuff singing	Sound of Video with Jay and Professors and stuff singing	*Lights as in Discoteque*
Countess Quanta (*looks with surprise around*) They have good time at PSU. … **Schrödinger Cat.** And they do not work…			
Bohr*: (to Countess Quanta)* And who are these two crippled monsters? (*shows to Golem and Frankenstein Monster*) **Golem and Frankenstein Monster** *make offended gestures*.	***Slide 3.6.*** Qubit and Qubot		

Countess Quanta: We do not use this word now, you know, we are now politically correct. They work here as research scientists and lab technicians. **Golem and Frankenstein Monster** (*They dance, play guitars and perform their standard tricks*).			
Darwin, Confucius and al-Khwārizmī. *sing and dance, supposedly synchronized to the motions of professors and stuff from the video and to sounds.*	**Video with Jay Penev and Professors and stuff singing** Come on, y'all let's clap some hands, Even Greenwood's in the band, Rockin' out with famous names, Brano, Holtzman and McNames We are gonna have a bash With Perkowski, Hall and Daasch Look out, it might get serious Ukulele and Siderius	**Sound of Video with Jay Penev and** Professors and stuff singing	*Lights as in Discoteque*
Bohr: *(rolls in)* Hey Quantum brothers, I promised to join you and learn something in this great University (*stops surprised as nobody works*).			
Darwin: (*sings and gestures with his hand rhythmically*) **al-Khwārizmī:** (*sings and gestures with his body and arms, Kuwaiti music)*	**Video with Jay and Professors and stuff singing** Remember the first time you failed that class, "Digital Circuits" with Mark Faust? We couldn't be any more proud To have Lendaris in the crowd Tymerski, Teuscher, Sutherland With ukuleles having fun		
Schroedinger Cat *(dances, sings and dances)*	Some of these, they made you cry, Made you pull your hair and scream: "Why?"		
Schrödinger Cat, Bohr, and Schrödinger Cat: (*sing and gesture with their hands and bodies rhythmically*)	And at times, you got to laugh, With the help of our lovely staff! (we rock)		
Einstein: (*rolls in, in a hurry as of being late, sings and gestures with his hands rhythmically*)	Today's the day we say "Goodbye" But don't just yet get teary-eyed When employers never call We'll see you back in the Fall! (Hello, again!)	*The same goes through the large sound system*	

Schrödinger Cat, Einstein, al-Khwārizmī, Schroedinger Cat, and Darwin: (*sing and gesture with their hands and bodies rhythmically*)	Thank you for being a part of this! All of you we're gonna miss, Thank you all for being you, Now let's go to the barbeque! (*Video ends*)	*The same goes through the large sound system*	
Countess Quanta: (*sings and gestures with his hand rhythmically*) Come to PSU and take the class From Perkowski, Daasch and Bass You will learn about the quantu-um, Electro-ons and the vacuu-um	***Slide 3.6.*** ***Slide 3.7.*** ***Slide 3.8.*** Slides from Perkowski, Daasch and Bass labs and classes	*The same goes through the large sound system*	
The light points to a strange figure hanging in the air. **Einstein:** Who is this? Or what? (*to monster*) Hey, are you alive? Who are you?			
Frankenstein Monster: I am the first quantumly conscious being ever created. My real name is Josephus, but I am popularly known as Frankenstein's Monster, because it was Doctor Frankenstein from Germany who built me first before Countess resurrected me recently.	**Monster** (thin and tall man, hanging in the air, eyes and jaw individually animated, hands individually animated with three DOF each, body animated (can rotate and go backwards-forwards by special crane robot, legs animated with 2 DOF each, dressed in 18th Century male costume, simple but elegant, something that a professor would wear in 18th Century). His body is however scary and visible through plastic.		
The light points to a strange large figure at the back of the room.			
Schrödinger Cat: I am scared, what an animal is that?			
Golem. Hi, I am not an animal. My name is Golem, I was built by a rabbi in Mediaeval Prague. I was the first walking robot ever built,… and the first military kind of robot …. to protect my Jewish people. Thanks to Countess Quanta I am alive again and I got			

an opportunity to be useful again. *(plays his guitar and all drums sequentially and next in parallel)*			
Deep Voice from the darkness Let me introduce myself for completeness. *(Light on Saint Anzelm's Head)* **Brazen Head:** I am a robot built by Saint Anzelm. Famous mediaeval philosopher, alchemist, theologian and engineer. And a Catholic Bishop.			
Bohr. (*ironically*) Where is your body, robot? **Brazen Head:** Unfortunately my master died before completing my whole body. He built also a hand for me, which fact was lost in annales of history. (*light on the hand*), I can count in all number systems, see … *(he demonstrates counting on the hand)* *(***Brazen Head:** *shows some tricks with the hand, like counting and waving hello).*			
Brazen Head, Golem and Frankenstein's Monster *(speak with one voice together)* Recently we were teleported, entangled and resurrected to help the research in this lab.			
Bohr. (*to al-Khwārizmī)* Sir, your face looks familiar to me. How did you get here?			
Confucius *(answering Bohr, points to* al-Khwārizmī*)* This is AlHarizmi, creator of algebra, algorithms and one of top mathematicians that ever lived. He also plays Kuwaiti music in			

free time. He is our staff mathematician and Middle East consultant.			
al-Khwārizmī:: (*answering Bohr, points Confucius*) This is Confucius, the most famous philosopher of all times…. and here (*politely, points to Darwin*)…. Darwin. *(plays little drum and dances Kuwaiti dance with a sword)*			
Darwin (*bows***) …** and I am Sir Charles Darwin, the inventor of Darwinian Evolution.			
al-Khwārizmī:, Confucius and Darwin. *(speak with one voice together)* We are happy to be here as our theories are the base of quantum consciousness			
Countess Quanta: Let me finally explain everything to everybody. I am the director and Founder of Quantum Consciousness Laboratory at Portland State University. *(smiles)* When I invented quantum consciousness, I realized that there is still a lot of work ahead of me, so I resurrected the top thinkers and robots from the whole human history…. to help me,…. and here they are.			
Countess Quanta: *(turns to Schroedinger Cat and Bohr)* Now you know why I brought the two of you here? I have a lot of work and you will help me. We have to build the quantum tablet.			
Bohr: (sings and dances) Then –God- cre-ated –Feyn-man (6) Gro-ver, Shor -and -To-offoli (7) And computing became quantu-um Now was quantu-um e-very-thing And even the Universe became one big quantum field computer And quantum tablets u-huu Intel in-tro-du-ced to every school.			

Countess Quanta: *(calmly but firmly, to Bohr)* Not yet, not yet, we need higher grants from Intel.			
Schrödinger Cat: (*sings and gestures with his body and arms)* Quantum tablet, quantum tablet, Soon we'll have it, I would bet. It will change the world we know It will bring great knowledge flow	***Slide 4.9.*** ***Slide 4.10.*** ***Slide 4.11.*** Slides from Perkowski's quantum classes	*The same goes through the large sound system*	
Bohr: (*agitated and extremely happy, holds the prototype quantum tablet in his hand)* And I started all of this Thanks to quantum mechanics Next the quantum stuff improves World of quantum wonder rules	***Slide 4.12.*** Newton and Quantum Computer	*The same goes through the large sound system*	
Einstein: (*enters the stage, sings and dances*) In a quantum robot field, every-thing joins every-thing. All entangled universe Serves your mind on life purpose. All theories now combined, all is used, all unified… **Darwin** … we evolve **al-Khwārizmī**: …. We calculate **Confucius**…. Follow ethics everywhere, And beautiful etiquettes **al-Khwārizmī**: …linking cultures makes us happy **Countess :** All is blessed as we now see, …. human, robot, animal, tree… **Fishes**: fishes… **Brazen Head**: Catholic **al-Khwārizmī**: Arab **Einstein, Bohr and Golem:** and a Jew **Fishes**: Fishes, fishes **Veribot the Drummer:** and Mu-si-cian			

Monster: and a monster too.			

	Slide 4.12. Slides of modern Quantum computers Quantum Tablet.	**Voice of Intel Arm** *(deep voice): Quantum Computers of 22nd century* Quantum Tablet.	
All robots *move but do not dance and do not sing. They may talk silently to one another.*	**Slide Projector:** ***Slide 4.12.*** And the quantum tablet changed the world to a better place. And the scientists lived happily and productively ever after.	**Sound.** **Voice of Narrator:** And the quantum tablet changed the world to a better place. And the scientists lived happily and productively ever after. *Silent mysterious music.*	**Lights** should make a mysterious emotion of future science.
All robots *freeze*			
	Slide Projector – ***Slide 4.12.*** *displays names of creators, thank you to all involved, like in the movies. The text rolls up like in Star Wars.*	**Music:** *futuristic or Star Wars finale.*	**Lights:** *off* **Front Curtain** *falls down.*
	Slide 4.12. ***Slide 4.12.*** Slides from various labs and projects, selected using Kinect by audience members.		
Schrödinger's Cat: But we were supposed to learn at PSU. **Bohr and Einstein.** This is so happy a place, we will start to work	*A description appears from the sky* *Thanks to quantum consciousness humanity*		

tomorrow. Let us celebrate now. *All robots dance, sing and play instruments. Complete cacophony. Lights go slowly off. But the music keeps playing when the audience leaves the theatre*	*found peace and harmony and all lived happily ever after.*		
They audience stays to interact with robots, using Kinects, cameras and other sensors.	***Audience selected***	***Audience selected***	**Interactions selected by audience or randomly using simulated quantum algorithms**