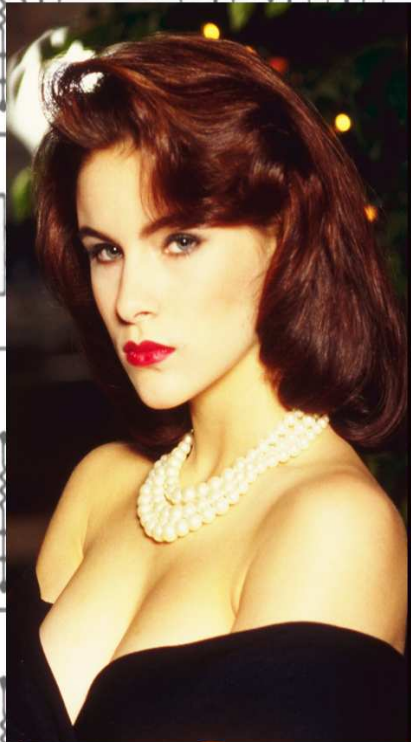


Maria

a scripting
language
for
interactive
sex

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In a nutshell . . .

the Maria scripting language controls sex devices (androids or automata) attached to the computer giving the device a personality and interactivity (responding to user actions). To find out more about this technology read on.

Preface

The concept of a sex scripting language is esoteric and difficult to explain, especially to non-programmers and others not familiar with computer operating systems and data networks. In most cases where a scripting language is used it is hidden from the user; the purpose of a scripting language is to simplify a complex task. Consider for example JavaScript which lets web pages do clever things such as display information based on time and date. The user doesn't need to know anything about JavaScript, the language is hidden from the user, buried in the web page; the user only experiences the **effects** of the JavaScript. In the same way, the sex scripting language is hidden from view. But since it controls devices (sexual automata or androids) that don't exist at the moment it will take a bit of time to put the technology into context, in terms of what can be done with existing technology, what people expect (or wish for) and how it can grow and adapt to incorporate burgeoning technologies. Given the rapidly rising power of computing, which has fuelled the growth of the Internet, simulation and interactive sex, the concept of a sex scripting language represents a leap forward for those marketing erotica and sexual devices.

A short history of sexual stimulation

Sexual stimulation has always rode at the forefront of technology. Especially important technologies are those which are simple and can be used in private; for example, 8mm projectors allow private viewing of movies which more complicated and expensive 16mm and 35mm projectors did not. Also of importance is the ease of creation and distribution of the items. An example of this is the printing press which for the first time provided ease of reproduction, relatively low cost and simple distribution/use/storage. In the following I'm trying to show how different technologies have had an effect on sexuality and how new technologies are used from a sex stimulation standpoint.

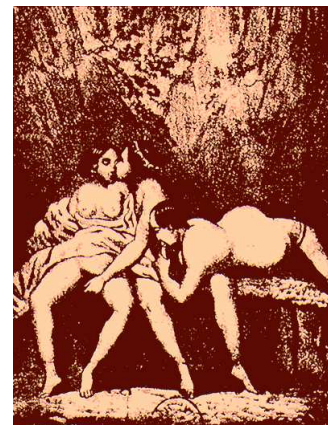


Drawings and Sculpture - Drawings and sculpture have a long history as sexual stimulants, especially in Asian countries (Ploss 1935). Examples of erotic sculpture exist in the Lingaraj Temple, Bhubaneswar, India constructed in the 11th century. Many statues in India had phalli upon which women would ritually deflower themselves (Ploss 1935).

Mechanical devices - Mechanical devices such as the godemiché or dildo (artificial penis) have origins dating back to antiquity (Cohen 1966, Ploss 1935). Lucian in the 2nd century A.D. refers to the "artificial private parts, which apparently work quite well" of the moon-people in his *True History*. Although *True History* is fiction, Lucian was likely

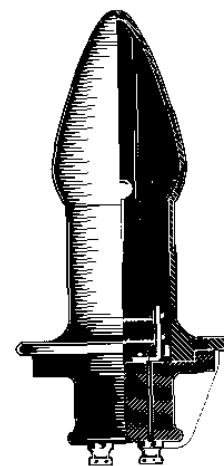
referring to items that actually existed at that time. By the 18th century the devices became quite elaborate, some containing mechanisms to simulate ejaculation as mentioned in *The Lifted Curtain* by Mirabeau (Mirabeau 1989). Shakespeare mentions the dildo in "Winter's Tale" Act IV, Scene 4 ("He has the prettiest love-songs for maids; so without bawdry, which is strange; with such delicate burdens of dildos and fadings, 'jump her and thump her;"). Other mechanical devices include Rin-no-tama balls (vibrating metal balls inserted in the vagina) which are still used. Water was used for sexual stimulation in many European spas in the Victorian era. Some mechanical devices for men were built but these tended to be rare because of the complexity. Phallic substitutes were, by contrast, simple to create, small enough to hide and use discreetly.

Printed text - With the invention of the printing press in 1440 by Johann Gutenberg (Kapr 1996), publishing and distribution written erotic works became much simpler. Adrian Johns writes of the early printing houses, "Learned scholars and gentlemen alike had to commit their tomes to be printed in the midst of almanacs, pamphlets, and (in the case of Newton's *Principia* pornography." (Johns 1998) Examples of early printed erotica abound including the works of the Marquis de Sade published in 1790. Printed text and artwork could be sold, kept and used in private. Today, computer printers, photocopiers and digital presses let the small operator publish his or her own erotic works in private.



Photographic - The invention of the camera in 1839 sparked an underground market for erotica that was more realistic and detailed than painting or drawings. The introduction of negatives and paper prints expanded the market further as did the introduction of the stereoscope (3-D photographs) and the postcard (both around 1870). Again, simple technology for viewing and privacy drove the development of erotic photography. The Polaroid-Land process, introduced in 1947 (Newhall 1964), provided amateurs a method of easily producing erotic photos of their own, simply and privately.

Electromechanical - Electrically driven mechanical stimulation (motor or solenoid). The first recorded use of electromechanical stimulation was in 1878 at the Sâlpêtrière (Maines 1999) in Paris. After 1900 electromechanical stimulators for home use began appearing on the market. The first electromechanical vibrating vaginal insert developed in the U.S. was patented in 1911 by John Keough (Levins 1996). Both low end devices such as simple vibrators and high-end devices such as the Sybian are now available. Male devices such as the Venus II, although not as common, have been developed.



Android/Robot - Full-sized, life-like human replicas called 'fornicatory dolls' *atomes de voyage* (Bloch 1928) have been produced throughout history but are rare due to the expense and complexity. Most life-sized sex toys available today are inflatable and more of a novelty than anything else. One exception is Real Dolls which are expensive (\$3000 and up) silicone rubber dolls. Real Dolls do not contain any mechanical/electrical mechanisms.

Electrostimulation - The use of electricity to directly stimulate the nerves. Electrical stimulation dates back to the late 19th century (Maines 1999) when devices were sold as "electro-therapeutic." Also popular was the violet wand (also called violet ray) which used a high voltage generator and gas-filled tube to create various dermal sensations. Modern electrostimulation devices use electrical current to directly stimulate the nerves. Problems include placement of electrodes, adherence of electrodes to skin and the discomfort of wires. Relatively few machines of this type have been developed. The most popular electrostimulation devices are manufactured by Paradise Electro Stimulation of Las Vegas, Nevada. Modified TENS (Transcutaneous Electrical Nerve Stimulation) units have been used by some bondage/discipline enthusiasts. A device called the Coïtron (Heslinga 1974) was developed in 1972 in Holland. The Coïtron was developed specifically for sexual stimulation using electronics but it seems not to have made it to market.

Motion picture - Erotic films began to appear as early as 1920 with a film called "Widow's Delight" featuring a woman masturbating with a vibrator (Blake 1968). The proliferation of 8mm amateur projectors just after the second world war created the market for the "stag" film. Films could be cheaply reproduced, sold and displayed privately on low-cost equipment. The downside was that 8mm films often lacked color and sound (complicated or unavailable on 8mm equipment)

Video cassette - The advent of the consumer videocassette in 1980 coupled with rapidly plummeting prices for VCR's created a market for sexually explicit videos. VCR's were simple to use, cheap and private providing an erotic experience with motion, sound and color. The introduction of low-cost camcorders opened up new areas to amateur productions, as did the availability of cheap video cassettes.

Telephone 900 service - Introduced in the 1980's the 900 service created an on-demand, instant gratification driven industry. Ease-of-use, low-cost, privacy and the one-on-one intimacy and interaction made phone sex an instant hit. Although the telephone system had been around since the 1890's, it took modern database and switching technologies to allow the simple payment of the service provider which in turn provided the impetus to develop the content.

Computer/Internet - Like phone sex and the VCR, computer and Internet sex has had to await the development of a payment system (usually secure credit card transactions) and a simplified, easy-to-use technology (web browsers such as Netscape). Internet sex combines the best of video (color motion and sound) with the intimacy and interaction of phone sex. Latency (time lag between the sending and receiving of the information) and bandwidth (the amount of information per time period) currently limit the amount of interactivity and video resolution in Internet sex. Even with the limited resolution and lag, two way video conferencing is popular on the Internet (Odzer 1997)

As can be seen, sex stimulation can be roughly divided into two groups: physical and non-physical. Non-physical are those technologies like videos, motion pictures or drawings that do not provide any direct stimulation to the user but are used as adjuncts to sexual activity (sex with partner, masturbation etc.). These technologies make use of the user's mind and require active mental participation and in many cases imagination to achieve full effect. Physical technologies such as vibrators, electrostimulators etc. provide direct stimulation to the user's body.

Interactive Physical Sexual Stimulation: The Final Frontier

What's next? One thing that is evident is that technological advances are co-opted early on for heightening the realism of the sexual experience. Sex was a major force in marketing video cassettes, pay-per-call networks and the Internet. Each technological advance added another dimension to the experience; video cassettes added colour and sound with low price and simplicity. Pay-per-call and 1-900 service added one-on-one interactivity at the expense of visual stimulus. The Internet offers audio, video and interactivity but with more complexity (video camera, sound card etc. required for two-way interaction). Sex stimulation is progressing from a cool technology or one where the user must do work (imagination, self-stimulation, etc.) to a hot technology where the user is more involved with a higher definition medium. Hot technologies such as television tend to displace cooler technologies such as books (McLuhan 1994).

Popular culture has paved the way for the social acceptance of interactive physical sexual stimulation with a long history of written work. The story of Pygmalion is an early example of android mythology. Pygmalion, a king and sculptor in ancient Cyprus, fashions an ivory statue of a maiden, Galatea. The goddess Aphrodite brings Galatea to life. Virgil of Naples, a magician, made an artificial prostitute for the Romans. In the literature of mediaeval Spain, Solomon ibn Gabirol built an automaton, a servant girl (Cohen 1966). Cabalistic lore gives us the legend of the Golem, a humanoid first created by Elijah of Chelm in the 16th century. Later Golem legends find the beautiful daughter of the Rabbi falling in love with the Golem her father created. A female automaton is featured in *The Sandman*, a novel by E. T. A. Hoffmann (1766-1822), and the basis for the ballet *Coppelia*. The creation of a female android (with definite sexual overtones) is the central theme of *L'Eve Future (Tomorrow's Eve)* written by French novelist Auguste Comte de Villiers de L'Isle-Adam in 1887. *La Femme Endormie* by Madame B. of Paris was written in 1899; the protagonist is an artificial doll capable of a rich diversity of sexual exercises (Cohen 1966). *Metropolis*, written by Thea Von Harbou in 1927, was the basis for the silent film by Fritz Lang. Maria is the heroine of the story; her persona is given to an android by the scientist Rotwang, who tries to use the android's sexuality to control Metropolis' workers. British novelist Aldous Huxley wrote *Brave New World* in 1932 in which he describes a virtual reality theater (the "feely") with, of course, a sex scene. *Neuromancer*, a novel by William Gibson written in 1984, popularized the concepts of virtual reality and cyberspace. Humans have been contemplating construction of sexual humanoids for centuries and the advent of new technologies has only sped things up. In mediaeval times, sorcery and magic created the android or automaton, in the 19th and 20th century clockwork and electrical themes are featured.

Androids and Cyberspace in Fiction

The house lights went down; fiery letters stood out solid and as though self-supported in the darkness. THREE WEEKS IN A HELICOPTER. AN ALL-SUPER-SINGING, SYNTHETIC-TALKING, COLOURED, STEREO-SCOPIC FEELY. WITH SYNCHRONIZED SCENT-ORGAN ACCOMPANIMENT.

'Take hold of those metal knobs on the arms of your chair,' whispered Lenina. 'Otherwise you won't get any of the feely effects.'

The Savage did as he was told.

Those fiery letters, meanwhile, had disappeared; there were ten seconds of complete darkness; then suddenly, dazzling and incomparably more solid-looking than they would have seemed in actual flesh and blood, far more real than reality, there stood the stereoscopic images, locked in one another's arms, of a gigantic Negro and a golden-haired young brachycephalic Beta-Plus female.

The Savage started. That sensation on his lips! He lifted a hand to his mouth; the titillation ceased; let his hand fall back on the metal knob; it began again. The scent organ, meanwhile, breathed pure musk. Expiringly, a sound track super-dove cooed 'Oo-oo'; and vibrating only thirty-two times a second, a deeper than African bass made the answer: 'Aa-ah.' 'Ooh-ah! Ooh-ah!' the stereoscopic lips came together again, and once more the facial erogenous zones of the six thousand spectators in the Alhambra tingled with almost intolerable galvanic pleasure. 'Ooh. . .'

The plot of the film was extremely simple. A few minutes after the first Oohs and Aahs (a duet having been sung and a little love made on that famous bearskin, every hair of which—the Assistant Predestinator was perfectly right—could be separately and distinctly felt), the Negro had a helicopter accident, fell on his head. Thump! what a twinge through the forehead! A chorus of ows and aies went up from the audience.

Brave New World
Aldous Huxley, 1932

"Every man-creator makes himself a woman. I do not believe that humbug about the first human being a man. If a male god created the world (which is to be hoped, Joh Fredersen) then he certainly created woman first, lovingly and revelling in creative sport. You can test it, Joh Fredersen: it is faultless. A little cool — I admit, that comes of the material, which is my secret. But she is not yet completely finished. she is not yet discharged from the workshop of her creator. I cannot make up my mind to do it. You understand that? Completion means setting free. I do not want to set her free from me. That is why I have not yet given her a face. You must give her that, Joh Fredersen. For you were the one to order the new beings."

"I ordered machine men from you, Rotwang, which I can use at my machines. No woman . . . no plaything."

"No plaything, Joh Fredersen, no . . . you and I, we no longer play. Not for any stakes . . . We did it once. Once and never again. No plaything, Joh Fredersen but a tool. Do you know what it means to have a woman as a tool? A woman like this, faultless and cool? And obedient — implicitly obedient . . . Why do you fight with the Gothics and the monk Desertus about the cathedral? Send the woman to them, Joh Fredersen! Send the woman to them when they are kneeling, scourging themselves. Let this faultless, cool woman walk through the rows of them, on her silver feet, fragrance from the garden of life in the folds of her garment . . . Who in the world knows how the blossoms of the tree smell, on which the apple of knowledge is ripened. The woman is both: Fragrance of the blossom and the fruit . . ."

Metropolis
Thea von Harbou, 1927

Rose could hardly wait to examine more closely the marvellous strange contraption. After explaining that it was an exact replica, if slightly oversize, of the male organ, I pointed out its features, chiefly the mechanism which jetted hot water or milk so cleverly that the recipient could not distinguish it from real semen.

The Lifted Curtain
Gabriel-Honore de Riquetti comte de Mirabeau, 1789

This progression points to integration of audio, video, and interactivity with true physical interaction using sexual devices. Many high end sexual stimulators (the Venus II and the Sybian are two examples) allow user adjustments but don't allow interactivity with a remote person or device. Currently, one company is marketing a simple gadget (a photosensor that sticks to your computer monitor) to allow someone on the Internet to control a vibrator or other electrical stimulator. It is, however, a one-way device, the only feedback for the user is by responding via the computer's keyboard. For true interaction the device must be able to sense what the user is doing and make use of that information.

Sex Simulation or Virtual Sex

When people think of physical computer based or computer mediated sex they often think of virtual reality often in the form of the Holodeck featured in *Star Trek: The Next Generation* or the rig used in the film *Lawnmower Man*. Virtual reality, however, is not yet up to the task of providing

a realistic sexual experience. To explain why, I'll first describe what virtual reality is and the three major classes of virtual reality.

Virtual reality is the creation of an environment or virtual world in the electronic memory of the computer. In memory the computer holds a digital description of the virtual world (sizes, shapes, locations etc. of objects) along with rules describing how these objects should interact (for example the effect of gravity, collisions between objects etc.). The user interacts with the world through display and input devices, the computer synthesizing the output to the user on-the-fly. Three major classes of virtual reality are (Glenn 1992):

Immersion VR in which the person is immersed or surrounded by the virtual environment. Head mounted video displays, head tracking systems, special gloves etc. are used to immerse the person in the computer created environment.

What is a scripting language?

A computer is a machine which requires a list of instructions to follow. These lists of instructions are called programs. By running different programs, the computer may function as a graphic design platform, a text editor, keep a set of accounting books or any number of other things. Programs are created by programmers using a variety of computer languages such as C, Pascal, COBOL, FORTRAN and many others. Many computer languages are general and can be used to write nearly any type of program. When a program is written in these languages, it is run through a translator called a compiler to produce an output that the computer can understand. Programming languages make it easier for humans to program computers.

The problem with programming languages is that most are difficult to understand (learning to program takes time and effort) and after being compiled can only be run on one type of computer or operating system (i.e. Windows 98, MacOS, UNIX). To get around this problem scripting languages were developed. Scripting languages are interpreted by computer programs while being used; compilers are not required and the scripts can run on a variety of computers. Scripting languages

are also easier to work with than compiled languages since most are application specific (intended to do only a narrow range of things). An example of a common scripting language is HTML or Hyper Text Markup Language used to encode web pages. By creating this language, the developers of the World Wide Web made it easy to send graphical content over the Internet. The HTML script is interpreted by the browser and is used to layout the page elements. Other popular interpreted languages include JavaScript, SQL (Structured Query Language), PostScript, awk, Perl and many more.

A general programming language could be used to run sex simulation devices but this greatly restricts the use of the devices and makes it difficult or impossible for the user to create a new persona in his/her android. For example, to activate an android "muscle" the general programmer might have to manage the timing etc. all in a complex program. With a simple scripting language, those details are hidden from the user by the interpreter. All that is required is to name the muscle and any parameters that are required (power, timing etc.) The interpreter takes care of all the details.

Desktop VR systems in which the person interacts with the environment through a computer screen and hand operated devices (mouse, keyboard, joystick etc.). Shuttered glasses or forcefeedback joysticks may also be used to increase the realism of the environment. Driving and flight simulations for the PC are popular examples of this type of VR system.

Third person VR systems in which the person sees their image in a virtual world displayed on a monitor. Their movements are used to control interaction. This type of system seems to be best suited to games (hockey goaltending for example) since the user is disembodied. Most systems of this type are used in exhibits and other public venues.

Desktop VR and third person VR provide a limited amount of interaction, usually in the form of a tactile hand-held joystick or wand. Immersive VR presents other problems.

Current immersive virtual reality is extremely limited due to several difficult technical problems. First, immersive VR is computationally expensive. Whenever the user reacts (i.e. looks around, changes position or interacts with the virtual world) the world must be updated. Anything that has moved must be recomputed and the world re-rendered, in real time. Even with the fastest computers available it is difficult even to update the visual scene fast enough. Many systems give the user a form of motion sickness due to lag in updating the visuals (as the user moves his/her head there is a delay in what they see). Worlds must also be constructed down to the tiniest detail in order to appear real. Again, this is expensive in terms of time and resources. Another problem is that humans see in three dimensions not only by stereo vision but also by selective focus. As yet this problem has no satisfactory solution; current VR systems use flat monitors and lens systems providing the eye with a single focal plane quickly tiring the eye and giving the user perceptual distortions.

The sense of touch in immersive VR is produced by what are called haptic devices. At the present time, these devices are

rather crude. Mandayam Srinivasan, the director of M.I.T.'s Touch lab stated in a 1999 article that, "Current haptic devices are not good enough for cybersex or virtual sex. You can feel contours and [flexibility], but it's still probably very far from what people would want." (Strauss 1999)

Immersive VR also requires what is called force feedback. Simply put, force feedback is the force your body feels when interacting with physical objects. If you come to a wall, you cannot go through it; the wall pushes you back with an equal and opposite force to your force against it. This force feedback is extremely difficult to create for several reasons. Physical systems have lag times which give odd sensations in the virtual world. Also, since many of the force feedback forces are quite large, it represents a safety problem should the system malfunction. The design of a suit with sensors and some type of mechanism for stimulation is daunting, given the range of human shapes and sizes, the amount of force required for sensory stimulation and the surface area that needs to be covered.

At the present time, immersion VR seems to be well into the future, at least from the perspective of providing a satisfactory sexual experience.

Instead of virtual reality, a sexual simulator in the form of a highly specialized sex android (mechanical or robotic analogue of the human body) is a real possibility. Simulators have a long history in commercial applications. Aircraft flight decks are created as simulators using computer controls to provide instrument readings, visual images outside the aircraft etc. These machines are costly (due to their size and the complexity of the system being simulated) but provide a highly realistic training environment for commercial pilots. The primary difference between true virtual reality and a simulator is that a simulator is physically constructed to simulate a particular device. A flight simulator can simulate different aircraft but not for example a truck or crane. True virtual reality systems can simulate any type of device.

FAQ - Frequently Asked Questions

In the following I've tried to answer some of the questions that I've been asked. Trying to explain this project to a number of people has been difficult due to the breadth of knowledge one must have to really get a good grasp of the subject. As with many things, understanding something on a theory level is different than simply using it. Trying to explain the World Wide Web and its underlying technologies to someone who has never used a computer might be much the same; its easier to show the person and forget the explanations.

What exactly is your product?

Our product is a scripting language that operates a variety of sexual devices (androids or automations) and gives them distinct personalities and behaviors.

If it's only a scripting language why are you so concerned with the design and construction of physical units (sex androids)?

We need physical units, androids and sub-components for several reasons. One of the main reasons is to demonstrate how the scripting language actually functions. With an android we can load in several persons and let people see how things actually function. We also require androids for experimentation and debugging the software; to find out where the software can be improved. A "minimum" android is also required to prove that scripts meet minimum requirements set out by the scripting language. Finally, to demonstrate to manufacturers, investors and others that the concept actually works and to generate some enthusiasm and excitement for the scripting language.

Why stop with sex? Why not build a fully functional android (along with a scripting language) that will do household chores too?

First of all, sex is a fairly simple activity involving few body areas which makes it a reasonably straightforward task to simulate. Adding in disparate behaviors that must work together would quickly make the project complex and costly. Some problems such as bipedal locomotion (walking), recognition of complex images, dexterous hands are difficult and expensive to solve. Also, creating other behaviors falls outside of our area of expertise; there is only so much we can do.

If this is such a great idea why hasn't anyone else thought of this before?

First of all, sex androids and Internet sex are on the minds of many, many people. Several companies are currently working on physical sex via computer links (usually teledildonics) using simple devices, such as one which connects to the computer screen via a light sensor. The problem involves people not asking the right questions when it comes to sex stimulation mediated by a computer. They look at controlling existing sex toys whereas we looked at how humans actually have sex. They also tend to get caught up in the immersive virtual reality concept of full-body suits and head-mounted vision devices. Immersive virtual reality technology is expensive and has many problems requiring hundreds of millions of dollars to solve. In some cases, developers have created an expensive proprietary technology which failed to grab a suitable market. But the major problem with most people is that they simply don't have the breadth of knowledge to conceive of a sex scripting language. It requires knowledge of computer programming, computer science, human anatomy, human sexuality, electronics and mechanics. This is also far more than just a simple idea, the scripting language has already been fleshed out into a demonstration language with a browser and interpreter that actually run hardware. Ideas can't be protected, intellectual property (which this is) is protected under international law

If this technology (sex scripting language) is so valuable why give it away? Why not charge for individual users?

By giving the language away free of charge we hope to get people using it. One of the major obstacles in new technologies is overcoming people's resistance to change. The promise of sex is a powerful motivator, but trying to charge for the use would stop many people from trying it. Allowing people to use the language free of charge DOESN'T mean that we give up our intellectual rights to it. Being the creators of the language we'll be able to make plenty of money through certification, licencing and education ONCE the utility of the language has been established.

Depending upon the application, a simulator does not need to be very "smart" to be successful. Queen's Devices Corp. has been building a robotic construction flagman, named Silent Sam, since the 1960's. This life-like automaton performs its job using battery power and costs less than \$1000. It replaces flagmen at road construction sites; a hazardous, low-paying job that construction companies find difficult to fill. Since it looks like a person, people take notice of it and it performs well. Silent Sam is a simple automaton that performs a single function efficiently and effectively.

Sex is a constrained activity which involves only a small, highly specialized area of the body or at most several small areas of the body. As such the task of simulation is greatly simplified due to the limited scope of the simulation, much like the robotic flagman Silent Sam. The sex android/simulator would have several features:

- highly specialized (only sexual); may consist only of sub-components, genitalia for example
- stationary, can't move from one place to another under own power; user positions android or sub components prior to use
- mechanisms powered by low voltage electricity would simulate muscle systems (i.e. pelvic muscles, vaginal muscles) and other functions such as erection. This will give the user approximately the same sensation as that real muscle system would. This is NOT a simulation of the sensation via a haptic device which would be much more difficult.
- touch sensors imbedded in the android would function as nerves do in humans
- attach to a computer or network

New Technologies

There are many new items available that will help to make androids easier to manufacture/upgrade/customize or will add to the realism. Some of these items are:

Embedded processors are small, stand-alone computers that form part of another device. You can find embedded processors in microwaves, home entertainment centers, even toasters. Modern embedded processors use flash memory which can be upgraded over networks. Embedded processors inside android components will make possible easy upgrading, interchangeable components, customization of components and less wiring as the computer running the android can send software instructions to the component instead of directly controlling it with wiring.

Low-cost network interfaces will let users upgrade androids by simply connecting the new part to a local area network cable inside the android. Wiring is reduced (no masses of cables or electronics inside the android) and the customer can mix and match components. Although networks have been available for years, smaller, cheaper chips such as The iChip S7600A TCP/IP Protocol Stack, the first Internet-ready IC, from Seiko Instruments USA Inc. packages a number of components together. The S7600A is cheap and when paired with a network or modem chip can communicate over a network.

X-10 home automation is a communications protocol for network control of home electrical devices (lighting, heating, etc.). More manufactures are producing X-10 devices now and these devices allow the scripts to control external events as well as the android. Many X-10 devices are "plug-and-play"; very little is required

except to plug them in to the electrical system. Some of the items X-10 can control are lamps, lighting and anything else that can be plugged into an electrical outlet. Other types of controllers are available for home entertainment centers. Excellent for creating atmosphere in which to use the android.

Voice recognition technology is more reliable and easier to implement. Sensory Inc. makes voice recognition IC's that can recognize an individual speaker's voice and words. These IC's cost as little as \$2.15 each and can work in a stand-alone mode without a computer or processor. Add this to an android and it will recognize the user and react to his/her speech.

DigiScents Inc. is a company from Oakland, California that is creating an electronic scent synthesizer which can create a nearly unlimited number of scents or smells. This device hooks to a computer (much like a computer printer or monitor) and synthesizes scents according to instructions received from the computer. In March 2000 the company released its first software development kit (SDK) for creating software to run the scent synthesizer.

Controlling androids might become simpler with artificial muscles now under development. Here's an edited excerpt from AMRI's web page. *"The Artificial Muscle Research Institute (AMRI) was established at the University of New Mexico's School of Engineering and School of Medicine in 1996. The immediate goal of the institute is to develop, design, fabricate, test, and commercialize electrically and chemically controlled artificial muscles. These muscles will be used in applications relating to industrial, medical, and domestic problems."*

The android/simulator should be given ONLY the minimum function necessary to simulate sex. It's important to emphasize this point since it might seem only a small step (and very tempting) to add extra functions. Even adding such apparently simple tasks as mobility can make such an android project impractical. Creating a mobile android (one that is bipedal at least) is a non-trivial challenge; several research projects have worked on this with varying degrees of success. Honda spent over \$100 million in developing a bipedal robot that could walk. Integrating that behavior with other behaviors (navigation for example) is a complex and daunting task. The payback in terms of realism, especially in sexual function, is rather small. Designing and building a sex android with reasonable realism and sexual function is an achievable goal if some trade-offs (mobility, complex speech, etc.) are made.

Adding behaviors with Maria, the sex scripting language

Providing mechanical "feeling" or nerves to the sexual device is just a beginning. What is needed is a method of translating information obtained from the world via visual, aural or touch sensors into actions. This is precisely what Maria sex scripting language does.

Maria is a scripting language for computer operated devices that allows a person to capture in a simple script their sexual

response; how they react to stimuli and situations. The script controls interactive sex devices as well as sound, images, text and video and environmental elements such as lighting, sound effects and if available scent. Maria makes it easy for the script writer to encode an individual's sexual behavior in a compact, human-readable form. Maria is platform and device independent; it is not tied to any single hardware manufacturer, operating system or programmer.

- does not presume behavior. Maria is used to describe behaviors, it does not have any built-in behaviors. If you don't find a script you like, create one yourself according to your own preferences.

- network ready. This scripting language can be used over local area networks or public networks to provide interaction in real-time between various people. The scripted behavior helps to cover latency problems associated with network bandwidth limitations.

- interactive. Gathers information what the user is doing through hardware "nerves", "eyes" and "ears". Using control structures built into the language, this information can give varying levels of interactivity. The script sends output to the androids "sex organs" controlling what would be muscular functions in a human. Maria has been modelled on the functional anatomy of the human body.

The Future of Sex Androids

Should it be legal to have a sexual relationship with an android? is it moral to do so? In fact, should androids be built with any kind of sexual function at all? You may wonder why this would even be an issue, but consider this: Might it not be safer from a hygienic perspective to use androids as sexual surrogates and prostitutes than human beings? At least the possibility exists of disinfecting an android between clients, thus reducing the risk of spreading disease. Could this not be a more socially acceptable way of providing sexual services for hire? Certainly prostitution has existed as long as society—does it not make sense to control the medical consequences by applying some basic principles of hygiene? Humans have consistently manufactured sexual toys of increasing realism and talent; surely someone, somewhere will construct a sexually functional android if only for the titillation value.

In our own image: building an artificial person
Maureen Caudill, 1992

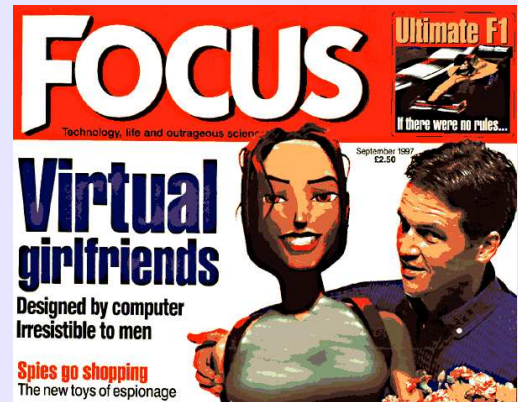
In an age in which the novelty of our machines is still high and the fear of bodies and their fluids even higher, cyberdildonics is logical, even inevitable.

Reach out and touch someone, Shift magazine
Richard Kadrey, 1999

"Already there is talk of creation of androids for sexual purposes," he [Arthur Harkins] said. "I think you are going to see an industry develop in the sexual-appliance area. At first it will be machine appliances, and eventually you will see biological substitutes or surrogates for human sexual organs being employed in stationary and mobile machine systems"

The Tomorrow Makers:

A brave new world of living-brain machines
Grant Fjermedal, 1988



- simple scripting language that non-programmers can easily understand and write using either a simple text editor or an interactive program. Scripts are written in ASCII (plain) text for easy transport between computer platforms. A simple compression scheme may also be used for long scripts to speed transmission. These scripts can be decompressed to human-readable form with a simple decompression engine using a freely available algorithm.

- easy built-in support for multiple threads (a thread is part of the program that can run simultaneously, in parallel, with other parts of the program)

- hardware/software independent. Doesn't require a particular type of hardware. Again, if you don't find hardware or a software interpreter/browser/compiler to your own liking, you can create your own.

- multimedia support for text, sound, video and still images. Can control environmental items if hardware enabled (lighting, entertainment centers, scents etc.) using X-10 protocols, infrared or wireless links

- scripting language allows for data persistence, (data exists between executions of the program) a simple type of memory your script can have to enhance its behavior

- available for your use without any licencing fees

Maria is fully interactive, meaning that the script accepts input in real time from the user and acts appropriately. The script writer has a wide range of options available to him/her that can be used to describe interactions. Scripting is simple since much of the implementation is taken care of by the system on which the script is run. In fact, a script writer doesn't need to be concerned about exactly what type of equipment the end user has available (within reasonable

limits of course). To understand how this works consider the page layout language PostScript by Adobe Systems. PostScript describes a printed page (type, graphics, pictures, colours etc.) in a scripted language. It can be sent to a variety of printers, from low cost laser printers that print in black-and-white at 300 dots-per-inch, to Linotronic machines that output film at 2400 dots-per-inch or colour laser printers on a network. In each case the page will print but at different resolutions based on what that machine can actually do; the designer doesn't have to know what machine it will be run on (within reasonable limits of course). If the file is colour, the colour information may be thrown away on the low end black-and-white machine and may be converted to gray scale on the high end Linotronic.

The Maria scripting format is available FREE-OF-CHARGE in a development kit which includes a simple browser. By making the Maria format freely available we hope to encourage its use so that thousands of files will be created. This will be a powerful impetus for hardware/software developers to create a wide range of sex toys, love dolls etc. along with programs ranging from the simple to complex.

The software driver is used to actually control the output device, both of which are manufacturer supplied. This helps to make the system device independent.

Interfaces for personal computers will be available cheaply. This lets you connect low-cost android components (i.e. genitalia only) to your computer easily. Just insert an adapter into the battery compartment, then plug the interface into your computer. Attach a nerve (switch) as required for feedback. It's that simple! Running the program activates the genitalia. The program can also control the environment (lights, music) for additional realism; the new breed of network ready appliances should be helpful here.

For entrepreneurs Maria has far ranging applications. Imagine constructing sophisticated love dolls that resemble historic personalities or popular entertainers (i.e. Marilyn Monroe) and renting them out in an adult version of Disneyland! Such a high-tech bordello would side-step laws that apply to human sex workers as well as helping to stem the transmission of sexually transmitted diseases such as AIDS (Fjermedal 1988, Caudill 1992).

Opportunities

The ownership of the trademark (Maria) and the copyright to the language are valuable intellectual properties. Areas of financial opportunity are:

Publishing - "How-to" books, reference books, tutorials etc. all are required by writers of scripts. Even though this is a simple, easy-to-learn language, educational material is still required. As well as information on writing scripts, raw material in the form of images, sounds etc. can be published on CD-ROM, DVD and the Internet

Developer Certification - The ownership of the intellectual property creates an opportunity to provide certification much like Microsoft does with its products or Sun Microsystems does with Java. When publishers of erotica hire writers they want to be sure that those writers conform to standards so that the scripts will work with the consumer's devices.

Software testing and certification - Does this software conform to standards? Ownership of intellectual property (trademark and copyright) lets us put our stamp of approval on products that meet our qualifications.

Hardware testing and certification - If a manufacturer wants to sell an androids, they are free to do so without paying for testing or certification. What certification does is to confer approval on an item; it tells the consumer that this item will work with Maria. Microsoft, for example certifies different types of hardware and software for use with Windows.

Seminars, workshops and classes - Not everyone can learn from books. Setting up an opportunity to learn the latest techniques of script writing, see the latest simulation hardware etc. provides a lucrative opportunity.

Hardware Development and Licencing - Develop androids and hardware systems in a lab setting, then licence finished designs to manufactures. Lets manufacturers make full use of their factories without investing in research and development. Licence fees based upon model and volume.

Script Writing - Suppliers of CD's, DVD's and webmasters may be interested in using sex scripts but don't want to set up a shop with writers to write the scripts. Instead, they'll contract out what they require.

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