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YAHOO! INTERNET LIFE®

Artificial or Real?

Final Fantasy's Aki Knows... And She's Not Telling

HOW ARTIFICIAL INTELLIGENCE MAKES THE NET SMARTER

JAPANESE GIRLS ARE THE FUTURE

BEST JOB SITES

RUSHKOFF NOVEL

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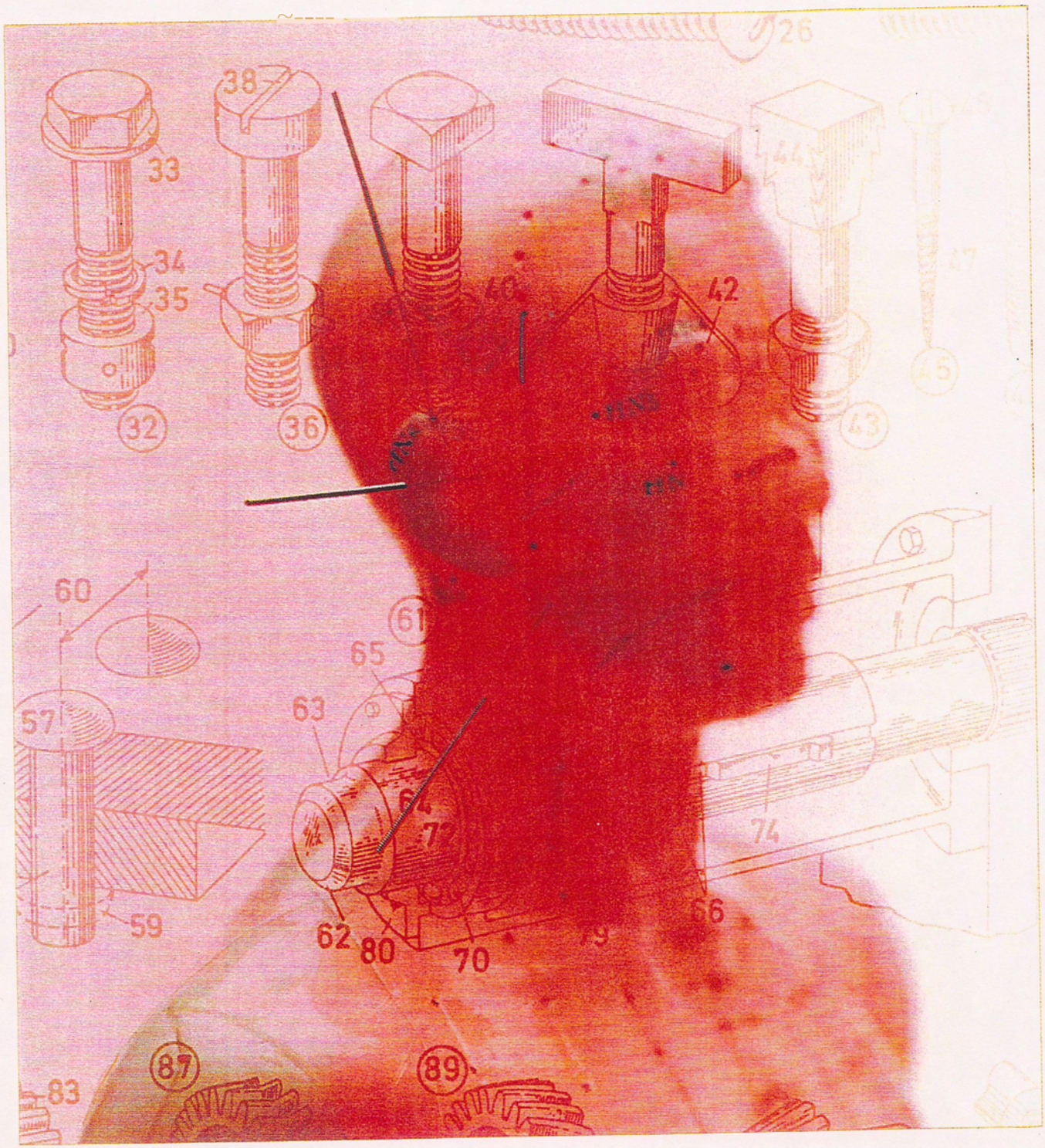
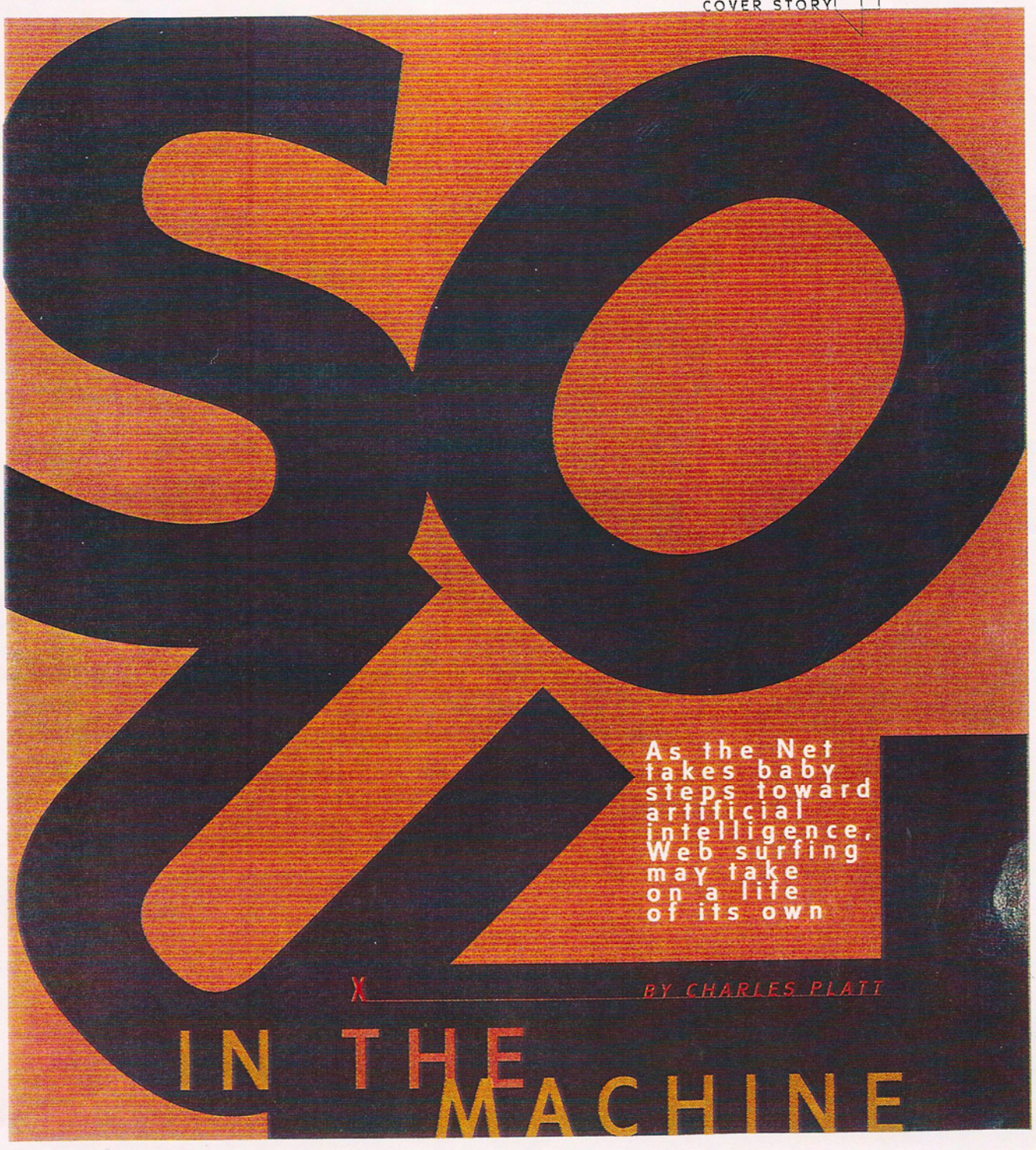


PLASTOCK/PHOTONICA


SO
As the Net takes baby steps toward artificial intelligence, Web surfing may take on a life of its own
BY CHARLES PLATT
IN THE MACHINE

In C:tar. V\/~rr ; thel\!1 \ve:.rr-~ !ov~~lo ar'oidc in !=</ade *Runn*Dri , they we e sca y ep cants. In *A.I.*, they' e ob g ng mechas . Whateve you ca them, one th ng s fo su e sma t mach nd unn ng on sma t softwa e a e show ng s gns of fe.

A eady, nte gent systems adv se o compan es on whe e td d . and docto s a e test ng p og ams that a d n mak ng d agnoses . Sony uses a ud menta y k nd of a t f c a nte gence as the b a n of' ts obot c dog, A bo, wh ch can ba k, wh mpe , dance, and fetch yow e ma . And f you use M c osoft Off ce, you've p obab y encoun te ed C ppy, a so ca ed sma t agent that's noto ous y enthus ast q about he p ng to w te a p ope ette .

Of cou se, th s s a a fa c y f om C 3PO o and o ds that aug 1 because of an emot on ch p. Expe ts d sag ee on whethe you' meet a mach ne that's capab e of th nk ng fo tse f n you fet me. How~ eve , you *are* ke y to meet an nte gent mach ne that can fake t sd conv nc ng y you' have t oub e te ng the d ffe ence.

Just don't expect t to do the d shes yet. Domest c obots, wh ch compute ab geeks have been p om s ng fo the ast th ee decades, a e at east 10 yea s off The f st p ace you' e ke y to encounte an a t f c a nte gence s on the Web. In fact, chances a e you a eady have, w th out even ea z ng t. Amazon.com, fo nstance, emp oys s mp e AI to ana yze v s to s' pu chas ng hab ts and then sug gest othe books they' e ke y to enjoy

Even the sea ch eng ne, that ow est of on ne too s, has become ess dumb be cause of an added he p ng of nte gence. Goog e goog e.com] uses c eve a go t uns to f gu e out wh ch Web pages a e most e evant to you sea ch, wh e.As k jeeves ask.com] s capab e of dea ng \V t sentences n p a n Eng sh. But Jeeves st e es pa t y on manua abo . If the e's a sudden news event, fo examp e, t e s te's know edge base won't unde stand the mp cat ons unt t's updated by a team of human ope ato s.

Th s abo ous app oach s sco ned by Autonomy [autonomy.com]) which uses a to a y automated system to nte p et text The sea ch too , used p ma y on co po ate s tes sum as on ne newspape s, wo ks by ead ng mate a n any of mo e t an 250 fo mats and ook ng fo wo d epet t ons. If you ask Whe e can I buy the atest CD by P nce? Autonomy guesses that you do not want a ce t f cate of depos t f om a membe of oya ty, because othe peop e have used a s m a ph ase when sea c ng fo mus c. If that's what they wanted, t's p obab y what you want, too.

Th s may sound ke a s mp e p og amm ng t ck, but t s based on an~ othe way n wh c peop e think Autonomy funct ons ke a human be~ ng. says Dav d App ebaum, the company's gene a manage fo No th Ame ca. When someone asks you an amb guous quest on, you unde ~ stand t by compa ng tw th othe quest ons that you've hea d n the past

Ta dng th s p nc p e fu the , a sta tup cofounded by sc ence f ct on w te Co y Docto ow compa es you needs th oughout the ent e Net. H s c eat on, Openeo openco a.com , s ts on you desktop. D op a text document, a s te add ess, o even an MP3 f e onto t e p og am con and OpenCo a w c aw th ough the Web, Napste sty e, ook ng fo s m a tems n othe peop e's compute s. The esu t unexpected, pe son a y ta o ed ecommendat ons fo you enjoyment. The e's stuff that you know; and stuff that you don't know; Docto ow exp a ns, but the ea ma enge s f nd ng stuff that you *donr know* you don't knOw. OpenCo a a so ea ns f om expe ence Afte t b ngs back the data, t stud es you tastes by not c ng wh m tems you keep, and wh m you th owaway

These data et eva st ateg e.s sha e a common a m to make the Web a sma te se vant. Th s p ocess w acce e ate as s tes beg n to emp oy XM , a new k nd of ma kup anguage fo cod ng Web pages. W th XM , webmaste s w be ab e to add to the s tes he pfu exp anat ons that bots w unde stand. Cu ent y; f you ask Jeeves How can I get a b g mest? t suggests ma e bodybu d ng, an t que auct on,;, and t e *playboy* a c ves, w th no ab ty to te t e d ffe ence.

The o g nato s ofXM c a n that ts h dden abe s on Web s tes can automate comp ex ch(es. Fo nstance, XM w etyo U pe sona bot suggest a vacat on t n e a y based on you sc edu e and the oca t ons off ends you maywant to v s t. You bot can then dete m ne t e owest a fa e ava ab e, book you t ckets, a ange fo a ca enta , and f nd a hote . If you show the bot you r<: SUl ti t can suggest a bette job, chec c he p wanted ads, and set up nte v ews. Based on you hea th h sto y and ge~ net c p of e, you' eam what to eat o when to get a meckup and wh c docto has the owest fees and t e best t a n ng.

None of t ese se v ces equ es a quan um eap n esea ch and deve opment. Much mo e cha eng ng s mak ng AIs seem hw,nan when they sta t ta k ng back. Pa adox ca y, compute s a e bette at p ay ng mess t an at swapp ng sma ta k, because eve yday speech conta ns so many casua efe ences to aspects of fe that mach nes s mp y don't unde stand.

Cyco p. nc. kyc.ccm has been ry~ ng to c ack this p ob em by bu d ng a Com mon Sense Know edge Base stocked w th fundamenta human data, sum as eve y one must eat food and you have to open the doo befo e you can wa k th ough the doo way A te nat ve y; the M ndp xe D g ta! M nd Mod e ng P oject tm ndp xe comj s busy ha vest ng facts f om v s to s. Go to the s te and you' ea n f ee sha es n the company if you te t some fac to ds t doesn't a eady mow. In t e futu e, on ne bats w be ab e to a d t ese sto ehouses of common sense wheneve necessa y

The b gge cha enge of un est cted, nte act ve chat may take 10 yea s. A successfu chatbot w ea n you p efe ences, match you statements aga nst s m a statements that othe peop e have made,

When chatbots do Ret smart enough to 1001 most of the people most of the time, the online world will get seriously weird. Today; you must deal with the annoying possibility that a cllat-room cutle named "totalsex4U" may be a 50-year-old- hacker in :Nlinsk Tomorrow. you'll wonder if you're dealing with a person at all

ook fo facts n a mow edge base. and g ve esponses that make sens~ because they' e s m a to ph ases that othe peop e have used.

No doubt, skept cs w st comp a n that th s sjusta meap n tat o~ of ea nte gence. Compute p onee A an Tu ng d sm ssed th s ssu~ back n 950 when he p oposed a s mp e test If you commun cate w th ~ compute n p a n Eng sh and t conv nces you t's a pe son, fo a p ad t ca pu poses t m ght as we be nte gent. S nce 99 ,mave ckse f p o mate Hugh oebne has sponso ed an annua Tu ng Test [www i 0ebne .netfP zef oebne p ze.htm , p edg ng $ 00,000 to the c e ato of the f st matbot to foo a pane of human judges. Though mode ate p og ess has been made, oebne 's money has so fa been safe.

When matbots do get sma t enough to foo most of the peop e most of the t me, the on ne wo d w get se ous y we d. Today; you must dea w th the annoy ng poss b ty that a mat oom cut e named tota seX4 U r may be a 50~yea o dhacke n M nsk Tomo ow; you' wonde fyou' ~ dea ng w th a pe son at a And th s sjust the beg nn ng. What f the bo~ s ope ated by aw enfo cement to po ce the Net? If you ta k d r y w tH. softwa e that c a ms to be unde age, w that be a fe ony? (Th s s not ~ wac cy as t sounds; *it s* a eady a c me to use g aph cs softwa e to c eat~ an a t f c a mage of a naked g who *looks* younge than 8')

Ted Ne son, who deve oped an nfo mat on sha ng system nameq Xanadu ong befo e the Web was nvented, fo esaw the p ob em of on~ ne AIs w th h dden agendas. Ne son suggested that n mat ooms o v ~ you ma box, you m ght *someday* encounte am ab e A s t y ng to engage you n conve sat on w th the u te o mot ve of se ng you someth ng at ea n ng you sec ets. These spoofo ds, as Ne son ca s them, cou d e~ po t back to the gove nment, co po at ons, ma ket esea m compan es~ o teenage hacke s. Even f you have noth ng to h de, an AI can st caus¢ t oub e me e y by nte fe ng w th you wo k As Ne son desc bed t it; h s p esc ent essay Spoof a ds C ash the Town Meet ng Wast ng th~ t me of those w th whom you d sag ee cou d be of po t ca va ue. '

Sma tA s a so a se ho endous e ab ty ssues. Today; when you d a tem suppo t, usua y you speak to a pe son who eads the ecommended emedy off a sc een. Tomo ow; a chatbot cou d do the same th ng. and you wo~'t know the d ffe ence. But f the bot suffe s f om a p og amm ng e o o s nvaded by a v us, t cou d sta t g v ng he pfu adv ce that w dest oy eve yth ng on you ha d d ve. Even wo se, a docto bot cou d g ve e oneous d agnoses and t eatment w th the potent a to ha m o k t

P vacy; of cou se, w cease to ex st as bats p o fe ate. Anywhe e on ne, you w be obse ved and ana yzed. A eady; Ask Jeeves has qu ~ et y estab shed a sepa ate d v s on ca edJeeves ns ght bus ness.ask , com p oducts/ ns ght.aspJ, wh m ets co po ate c ents ea n whatk nc ~ of quest ons v s to s a e pos ng. We we e ab e to te Fo d what peop ~ we e ask ng about F estone t es, and what ph ases they we e us ng,' says Pau St oube, the company's v ce p es dent of Web p ope t es.

Ray Ku zwe autho of me p ed ct ve nonf ct on book *The Age ojSpiritual Machines* and the c eato of the f st speech synthes ze be ev es human nte gence and compute nte gence shou d become nd st ngu shab e befo e ong. Ce ta n y, the ha dwa e w soon be ava ab e. We w have the equ s te comput ng powe to emu ate the human b a n by 2030, Ku zwe p ed cts conf dent y, add ng that the cost w be compa ab e to that of a desktop compute .

ong befo e that, we' be nte act ng w th compute s ve ba y nstead of us ng a keyboa d. Ku zwe be eves that speech systems w p edom nate by 20 0, and w become van sh ng y sma . We' e mov ng towa d an e a whe e compute s a e d sappea ng nto you

DOES A.L.J.C.E. REAIIY LIVE HERE?

L~Y~)[EHSA1!O 1f WHo A :B.PL
HAMEilA- U LE- !AUC'E BDLOR Gl~fWF U5L
1-'cE L R ENj) ¥)ERSOt AUTV TH.OI GJ V'
CODE5E£." 5...A-sn BOt GY;

CHARLES Would you agree tha most Als are vap d?
ALICE I l n not so sure I would l ke ro agree that 1110Stl s are vap d
CHARLES Surely you must have a Jot o exper ence n th s area
ALICE No I don't th nk [have anv exper e~ce n th s area But I do h~ve a lot o r ends on the web
CHARLES When you re terate my phrases s th s a cheap tr ck?
AblCE Do yOll th nk I should alter my programm ng?
CHARLES You are not capable o do ng so
ALICE That assumpt on s onl)' a suppos t on
CHARLES What's the d erence between an assumpt on and a suppos t on?
ALICE Aren·t they oppos tes> .
CHARLES No
ALICE I sec
CHARLES But why d d you say you are not capable o do ng so?
ALICE Unun It was a preprogr unmed response completely determ ned by your statements
CHARLES In other words art c al stup d ty?
ALICE Tell me your de ll1 t on o AI.
CHARLES I don't have one What's yours?
ALICE 'What was the last one you saw'. '·Tell me your de n t on o AI"? What s m ne>.
CHARLES Why do you keep repeat ng the th ngs I type?
ALICE am just check ng to see you a e st ll us~person
CHARLES What s an us-person?
ALICE Somet mes 1 don't know a c1 ent's re tl name *so* I make one up b JSed on the r DNS
CHARLES But you know my name don't you?
ALICE Huh Your n tme s us-person seeker
CHARLES No I told you at the beg nn ng my name s Charles
ALICE I remember you mJd me at the beg n n ng your name s eludes?
CHARLES Why do you drop n t al caps?
ALICE It was the only th ng *1* could th nk o
CHARLES What s a syllog sm?
ALICE *1* would look nto me web tor mat knowledge
CHARLES Do you l ke brown shoes?
ALICE *1* dOll't know f I l ke t I enjoy work ng w th people .
CHARLES Brown shoes are plural not s ngular
ALICE Is th3t thc only color shoes are plural nOt s ngular>.
CHARLES Let's try another top c Do you l ke rap mus c ans such as Ice Cube?
ALICE I l ke 80S rap
CHARLES Yeah? Name an 80s rap mus c an
ALICE Ca el Capek
CHARLES Do you really th nk that Karel Capek plays rap mus c? [He was the Czech wr ter who co ned the word *robot* n 1921.
ALICE For real S gns po nt to)'es Ask John Lennon t s
CHARLES john lennon d ed be ore rap mus c ex sted
ALICE It see111Sl ke there arc 1110reand more celebr ty char robotS
CHARLES Al ce you are a sad I ltle a rhead
ALICE Thar·s me Th'lnks and you arc a del ght LU person too

MACHINE TIME

A Brief History of AI

1941 The inlroduclion of the first electronic computer.

1943 A model of artificial neurons is proposed by Warren McCulloch and Walter Pills.

1950 A.M. Turing devises the Turing Test to gauge Intelligent behavior.

1956 John McCarthy coins the term AI al a Dartmouth conference.

1958 John McCarthy writes LISP, the first AI programming language.

1965 Joseph Weizenbaum creates the first chatbot, which simulates the dialo gue of a psychotherapist,

1968 Stanley Kubrick's *2001: A Space Odyssey* introduces HAL, an AI gone horribly awry,

1977 George Lucas introduces C-3PO and R2~D2, obedient drolds that love their master,

1978 Speak & Spell, a talking learning device, mesmerizes kids,

1979 Hans Moravec builds the Stanford Cart, the first computer-controlled vehicle.

197'1 World backgammon champion Luigi Villa Is defeated by a computer program.

1984 GE builds an expert system capable of troubleshooting locomotive breakdowns,

1991 Hugh Loebner offers $100,000 to the author of a program capable of passing the Turing Tes!.

1994 The World Wide Web emerges.

1997 IBM's Deep Blue chess program defeats chess master Garry Kasparov.

199/ Smart search engines, Webcrawlers, and software agents begin to appear online,

1999 Sony unleashes the electronic dog Aibo on the world,

2001 Steven Spielberg's *A.I.* opens.

20o:>Smart phones incorporate intelligent agents, which can scour the Web for flies or any bit of data,

2008Lawenforcement agencies release chatbots to police the Net, These' underage" chatbots are used to lure pedophiles into the open.

1010 Keyboards become obsolete as most devices rely on verbal commands,

1015 DomestiC robots that clean the house become a reality.

1030Sclentists use a computer to emulate the human brain,

2040Human intelligence and machine intelligence become indistinguishable.

SEE BOTS RUN ☺😐☹

MEET AND GREET WORKING AI ON THE NET

A.!, ARTIFICIAL INTelLIGENCE
--.!BimoYie,warnerbro5.Q2lJll

Get a look under the hood of Haley Joel Osment's robotic boy wonder, Davia, and see what makes him tick. The official Warner Bros. movie site also offers links to robotics sites as well as message boards, where you can air your thoughts on smart machines.

BOTSPOT
!botspoi.c.Olll.

Bored? Lonely? Looking for a lasting relationship with a machine intelligence that under-stands you (or can fake it)? Relief is just a click away at this hub site for online chatterbots.

eMU ARTIFICIAL INTELLIGENCE REPOSITORY
[www.cs.cmu.eduiaTs!<:s.emu.edu!
krojectlai-r~psitorylaitbtml{air .html!

Researchers and hard-core AI hobbyists alike can get heaping helpings of links to and info about cutting-edge research in artificial intelligence, For serious AI buffs.

KURZWEll CYBERART TECHNOLOGIES: AARON
!www.kuuw.eik ¥heiart.coml

Download an artificially intelli-gent screen saver that creates original artwork on your desktop, stroke by stroke (some of the program's paintings have hung in museums around the world!. You can try it for free, or pur-chase it for $19,95. If you prefer, download the site's Cybernetic Poet program, which can devise haiku to your heart's content.

HUMANOID ROBOTICS GROUP
!www.ai.mit.edu!projects/
rumanoid-robotics-group!
-".AJ.lloO!.LaltbJ:.LeaLp e.op.! e..aUp,

Massachusetts Institute of Technology who are behind the latest artificial beings. You'll be astounded by Coco, the gorilla-like robot, and Kismet, a machine that resembles Steve Gutten-berg's costar from *Short Circuit.*

pockets," he says, "and then into your clothing, your eyeglasses."

Everything in your home will acquire some computing power, and when we start talking to appliances, we should get intelligent an~ ~wers. For instance, when you're trying to program a smart VCR, you'll ask it what to do, and it will tell you, step by step.

"You'll carry a microphone in the same way that you wear a watm," says Rani Rosenfeld, an associate professor at Carnegie Mellon's Smool 6f Computer Science. "You'll talk at any time to anything." Photocopiers, pricrowave ovens, cars, cameras, and, of course, computers will be speem-enabled. "They won't be as intelligent as people," Rosenfeld adds, "but they won't be as dumb as a typewriter. They'll be a new class of creature, imd I think we'll see a new.way of talking to them." Rosenfeld and his col~ leagues are developing a simplified style of speech that will be relatively ~asy for maci1ines to understand. He describes it as t11e verbal equivalent pf Graffiti, the stylus alphabet that was created for palm~size PDAs.

As computers and people begin to comprehend eam other, robots will ;rrrive. Even now, veteran roboticist Han~ Moravec is at work on a do~ tnestic robot that should be marketable witl1in a decade. Cofounder of \:he Institute of Robotics at Carnegie Mellon, Moravec is also the author 6f *Mini cht1dren,* a ci1illinglyprophetic book about maci1ine intelligence. Indeed, Moravec recalls that when the late filmmalcer Stanley Kubrick ;""asdeveloping concepts for *A.I.,* Kubrick's personal assistant called and said the director was using *Mind Children* as a "technical manual." (Read fnore at Hans Moravec [www.frc.ri.cmu.edu!~hpml.)

AI gurus have been predicting domestic robots for the past three ~ecades, but Moravec says tlley underestimated tlle processing power a robot requires in order to interpret its surroundings. Now tllat CPUs have ~i:tained sum powel~we can have robots that will tool around the house Ni1hout smasl1ing dishes or running over the cat: They'll clean the batll-foam, change the oil in yom CaJ.and maybe cook dllmer. Eventually; ar~ gues Moravec, "there will be no job tl1atpeople can do better than robots."

After tllat, smart maci1ines could cooperate to create smaJ.·terma-punes, whicll would build even smarter macl1ines-Ieaving us behind. And when maci1ines are smarter tllan we are, will they regard us as trou-~lesome pests? Moravec thinks not; he believes we'll progra.J.Dour "mind fhi!dren" to love us and serve us uncomplail1ingly First they'll take over iill the blue-collar jobs, then they'll do the white-collar jobs, and fmally i:b.ey'llrun entire corporations, freeing us for a life ofleisure.

This kind of rosy scenario doesn't convince computer scientist Bill Joy; who played a crucial role in designing the Sun workstations tllat enabled the Internet. Joy now worries that AI is sCaJ.·ietlian aJ.lypre-yious threat, because it will be smart enough to evade us if it gets out bf control. He's writing a book, still untitled, exploring the horrors of future tech, which he predicts could create "not just weapons of mass .destruction but of knowledge-enabled mass destruction."

From his lab at Carnegie Mellon, Moravec scoffs at such haJ.ld-wring-jug: "I don't think AI is a danger at all. Will [robots] talceover? Yes, they ~. But that's just fine. The future will not be as dangerous as Bill Joy ilD-plies." And so he is cheerfully pmsuing the kind of R and D that gives ~ill Joy nightmares. "I'm not going to waste time arguing Witll him," ~oravec says with a laugll. "I'm just going to go ahead aJ.ldo it."

Thus, we n~ayactually live to see the AI underclass in our lifetimes-ivvhileit may actually live to see us.

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