Computer Chess

By Andrew Bujalski
Hi, I'm Robert Lawrence with the Advantage Corporation in San Diego,
and we have a Colby 5 here,
which is highly optimized
for playing chess.
And we have designed it around
a recursive assembler routine
that uses a brute strength approach
to finding the optimal route.
I don't want to give away exact numbers,
but we've got the fastest depth-first
search to get the most number...
We can predict more turns in advance
than any other computer,
so we've got a good chance.
My field is experimental psychology,
but I've spent the last three years
studying chess skill
in both humans and machines.
And this is TSAR.
This is the latest iteration of Caltech's
computer chess programme.
This is 3.0. Last year, 2.0 won
this very same tournament.
Computers are getting smaller,
they're getting better, they're getting faster.
It's a matter of time before
we beat people with these things.
(Interviewer) Do you guys have a programme
in the competition here today?
No. Don't know anything about it.
We're just watching 'em get ready
for the end of the world here.
- World War Ill.
- That's what we're here for.
Getting in on the ground floor.
(Interviewer) Do you think a human being
will ever beat a person at chess?
Oh... Between a "human being"
and a "person"?
My money's on the computer.
(Interviewer) Er, I mean a computer...
If you ask Captain Apocalypse there...
I just wanna win at chess.

(I COLLIE RYAN: "Nothing But Changes")

What can I say, there is nothing but changes
J' Nothing but changes
What can I say, there is nothing but changes
J' Nothing but changes
You and I stay the same anyway
J' Does it really take time to be free of your mind? J'
(Man) Hey! Hey!

Do not ever shoot at the sun, you're gonna burn out the tube!
- I wasn't shooting at the sun, it's fine.
- You're shooting at the sun!
You're gonna shoot the rest of the weekend inside.
We want to be only inside.
That's it!

But computer chess goes back even further, to the mechanical Turk, 1770, the original chess-playing machine. It played against and defeated Benjamin Franklin and Napoleon Bonaparte. Well, he had a secret. There was a human being inside the machine. Though the first was a fraud, we're working to get back to that level of chess play when machine beats man.

I greet you for our annual North American Computer Chess Tournament and present you with a panel of the best and the brightest.
From my left, there is Les Carbray
from Allied Laboratories.
Hi there.
Martin Beuscher,
sitting in for Tom Schoesser.
And that's last year's winner,
TSAR 2.0 from Caltech.
Roland McVey from MIT,
the programmers of STASIA.
And finally Mike Papageorge,
who is an independent programmer.
Is there a computer programme
in the house
which can stand up
to a human chess master?
That's me!
When will a machine beat me?
Many years ago
I made a public wager
that no computer would beat me
until the year 1984,
and that date is quickly coming up.
So what do you think, gentlemen?
Will I win my bet?
I... I think you're cutting it close,
but I think you will win that bet.
Erm... If I was in your shoes,
I wouldn't extend it any.
I think within two years of that, 1986,
you won't stand a chance,
and I think that,
say another ten years after that,
there isn't a man or woman alive
who will stand a chance.
Well, there may be some disagreement,
but look at the speed with which
the technology, the software,
but particularly the hardware,
is progressing right now.
And just based on that speed,
barring a calamitous event
like World War Ill to set us back,
I truly believe it to be inevitable.
How about any of the other gentlemen,
do you have a thought on this?  
Want to chime in?  
This articulate panel?  
We've experimented some  
with parallel processing  
and then we're doing selective search,  
and all the algorithmic and software things  
that we're doing  
makes a difference,  
it does make an improvement,  
but it's dwarfed by the improvement  
we get just with better hardware.  
More memory and faster processor.  
We're blessed at Allied  
in that we have the equipment,  
we have the resources  
at our disposal, so...  
The person I'm really excited to talk to  
about real gains in software  
is perhaps Tom Schoesser,  
who I thought was going to be here  
on this panel?  
Yes, Professor Schoesser  
will be here shortly,  
he is delayed,  
but he will be here.  
OK, could you perhaps  
talk about some of that?  
Talk about advances?  
Well, I...  
I think it's safe to say that we're operating  
in some of the same avenues as Allied,  
but maybe Professor Schoesser  
could speak more to that,  
but I'm not necessarily certain  
he would speak about it.  
Well, anyway,  
whatever you did last year was working  
because TSAR 2.0 was the winner,  
and they were especially good  
about endgames,  
and that's a place  
where computer programmes often falter.  
So I think what I'd like to show is an example
of what happened last year.
And I'm sorry
to do this to my friend right here, but...
So, STASIA versus DAWN.
Well, this should have been
an easy win for STASIA.
Any human being can see
that there's a forced queen-takes-queen,
and it's a very easy victory for White.
But instead... Queen checks.
Queen checks.
Check, check, check, check,
back and forth,
over and over again,
lost in a loop.
Very, very embarrassing,
wouldn't you say?
Er, yes.
It was not our finest moment.
But you bring up a good point.
I think we've seen a lot of increase
in hardware speed,
it's definitely led to stronger game play.
In fact I think we're searching the tree
deeply enough now
that we're catching
pretty much all of the tactical issues.
But STASIA's greatest weakness,
which I think is the same weakness
all our programmes share,
is that it really has a very poor understanding
of the positional issues.
So this year at MI we've hired a grandmaster to help us out.
He's helped us come up with a couple rules
on the endgame specifically
that will hopefully help us
avoid the comedy that we saw last year.
Mr Papageorge,
we haven't heard from you yet.
You usually have
a very unique opinion, so...
(Clears throat) Frankly Pat,
I have to tell you I find the programming
of my fellow competitors here
to be almost as boring as this discussion.

(Laughter and clapping)

Why, because the machine can't compete against the human soul?

(Henderson) Very interesting!

Sure, sooner or later somebody's gonna write a programme that's gonna beat you in '83, in '85, who cares?

Listen, you guys are just trying to eke out one little victory versus each other, you know? You get here this year, you get here next year.

My programme is seeking harmonies, seeking innovations...

- I'm not entirely sure...
- That's what I'm doing!
- ...from the perspective of programming that it actually means anything.

(Papageorge) Well, we'll see when we get to the competition.

(Woman) Could you please spell your name for me, sir? Sure, it's P-A-P-A-G-E-O-R-G-E.

I don't see anything here.

- I'm sorry.
- P-A-P-A-G-E-O-R-G-E?
- No.
- M-I-C-H-A-E-L?

I'm sorry.

I could call to one of the neighbouring hotels and see if there's an available room.

No, I need to stay at this hotel where the competition's being held!

(Henderson) Um, I am Pat Henderson, I am very excited.

We have players from all over America, Canada, Quebec...

Just great, and we have something new this year, we have a lady who is competing, way in the back corner.
I'm happy about that too, she's welcome.

So, the way this tournament works is this, we play Swiss system – that's five rounds. That means everybody keeps playing. If you lose, you play to the end. However there is one big winner, and that winner gets a $7,500 prize.

And the other thing you get to do, you get to play me. Stick around for the last day because I challenge that winning chess programme. This will be a gruelling couple of days, so let's keep it light, let's keep it collegial, be respectful, and of course have fun.

Let's begin round 1.

(Beeping)

So, er, Tom Schoesser – is he showing up? He's a good guy. Way ahead of his time. He's like Tesla, he's so far ahead. I wanna talk to him about the "Eureka moment". And frankly, we're on the way to a kind of timid strategy on the side of White. I think the reason is, they are playing the very, very strong Caltech TSAR 3.0 team. In this case, maybe the programme is trying for a draw? In fact I defy anybody to tell me any theory of Tesla's that's been disproven today. I mean, wireless energy transfer, radio before Marconi, the spark plug, alternating current engine... Rook to D8. – Maybe the Industrial Revolution.
- No, it says E8...
TSAR takes pawn.
Queen takes queen.
And rather than capture queen,
the rook just approaches it.
Is there any possibility that this is, er...
some kind of, er, very advanced...
I mean, er...
we just gave up a queen to, er...
to get his queen there
and now we're basically just...
Well...
Um...
- Don't move that rook.
- All right?
- Be right back.
- Excuse me! Excuse me...
There seems to be a little glitch here,
maybe we should just
follow with the camera
and I'll look over here
at the STASIA SHORTSLEEVE game.
We're having
serious technical problems,
- I need to run a very, very brief diagnostic.
- I'm sorry, once the clock has started...
There's a tiny...
I'm almost certain I know what it is,
it's just going to take
a moment of our time.
I appreciate that,
but unfortunately once the clock has started
we cannot halt the game.
OK, er...
That's understandable.
We can go ahead
and leave the clock running.
It's gonna be a very brief diagnostic.
I'm almost certain
I know what the issue is.
- I'm sorry, there's no adjusting the code.
- We're at a point now... this game is not...
And MIT just won.
Great playing everyone, great round.
I've got your new table assignments up here on the projector. Eight of you will be moving. Er, let's be careful and, of course, watch for cables. Good luck. Oh, God...

Peter, can you tell me what's going on here? I mean, chess is the game where you're supposed to protect the king, right? Yes. Rather than sending him out to die at the earliest opportunity.
- Is that right?
- Yes.
- Yeah?
- OK.

Do you have any idea what game it is that TSAR is trying to play right now? Can you enter the move? (I Blues tune on electric keyboard) Scotch, man? God, yes. Another of these for the Rules Committee here? (Chuckles) Thank you so much. A lot of late night coding sessions fuelled by this stuff. You don't find it blurs your judgment? I've got it down to a science, you see. There's a sweet spot. And the sweet spot is three scotches. Four? You start to get a little bit drunk, a little bit fuzzy. One or two, it just doesn't work. But on three scotches? A man on three scotches could programme his way out of any problem in the world. (Chuckles) Excuse me, I'm gonna go to the bathroom.
OK.
Shelly, hi. Mike Papageorge.
I was one of the panellists.
- Hi.
- How you doing?
Fine.
I see you're with the MIT team.
That's wonderful, I think that we need more women here at this conference.
I mean seriously,
you get all these guys together
to come up with a solution for this problem,
what do they come up with?
"Brute force." Brute force.
It's pathetic, really.
I'd be willing to bet
that you and I are the only ones here
who even understand
that programming has a feminine side.
Anyway, I would love to stay in your room
if you have an extra bed.
I... I'm so sorry
that you lost your room.
I... I don't have an extra bed.
Could I just crash on your floor
or something?
I just need, you know,
a blanket and a pillow really.
Just somewhere where I can crash
till tomorrow morning.
The thing is,
the computer's in my room, so...
I would probably need to check
with the team to make sure...
What, McVey?
He's fine, he loves me!
Excuse me.
Sorry to eavesdrop, but I don't think...
Can I help you guys with something?
Yeah, I don't think it's a good idea to...
with the computer equipment in her room.
I... I just don't think
that's a good idea.
Sir, sir... we, unlike Shelly,
we have a double, we have plenty of space.
We'd be happy to have you stay with us.
- You can stay in our room.
- Yes, no problem.
What?
(Man) So the thing, er...
the thing you got to remember is...
When I'm talking,
I'm not really talking, he's talking.
When I'm asking questions,
he's the one who's actually asking them.
He's just asking them through me.
You can answer me...
- But, but...
- It's all going back to him.
He's pulling the strings.
- How do you feel about that?
- I... I'm, er...
No, no, no!
You've got to answer me.
So...
explain this to me, because...
guys like you are, like,
from Mars, to me.
How does somebody
end up being you?
I mean, how do you get to be you?
- How do I get to be me?
- Yeah. (Chuckles)
- How do you have to be you?
- How do I have to be me?
Yeah.
How do you get to be you?
Well, it's hard to sum up.
For the most part
I'm doing what I love to do.
Um... but I've got
the resources that I need.
You know, I... if I need...
if I need hardware,
if I need computational cycles or whatever,
I mean, I've got that all on my...
No, but tell me, like, like, like...
Like, you get up and you... what?
You take a shower, you eat breakfast, you get in your car, you get on the highway?
- I'm, er...
- What are you doing with your life?
I'm... developing a computer chess programme!
Imagine a world where children can hone their skills playing against machines, where you've almost got an electronic chess coach...
But what if it's the computer honing its skills playing against children?
Well, I think that's part of a... I think that's part of a bigger question. From a technical point of view. Can you look me in the eye and tell me that you have not... had any interaction with the Defence Department, the Pentagon, DARPA, the intelligence community, the entire...
- John invited me.
- Fine.
They don't call it the "military-industrial complex" for nothing.
(Visitor) Hey, how's it going?

HEY:
Welcome to our little "after hours" joint here.
You want a beer, or you want some weed? There's pills in the back.
Nah, I usually abstain.
(John) Usually?
- Have a peanut, at least.
- All right.
- Let me... Let me...
- Actually I want one of those too. ...accept some assumptions that I may not believe.
Let's say that, er...
Let's overstate my importance.
Let's say that,
yes, this work that I'm doing,
they're very interested
and they're looking at every theory
that I come up with
and applying this to their great
military machine, or intelligence machine.
- I mean, let's...
- (John) It's not even a metaphor!
I mean, there are two sides,
different colours,
one of 'em's got to win,
one of 'em's got to lose.
It's gonna be ugly for the ones that lose.
There are "knights,"
there are "kings," there are "queens."
This is obviously a militaristic problem
that you're trying to solve.
(Camera clicking)
(Carbray) Are you...
are you trying to recruit me here?
Are you from the Pentagon?
Is there something
you're not telling me?
Er, I get around,
but that's not...
Oh, you get around?
If I'm all that you seem to be suggesting
that I am to the Pentagon,
then if I wasn't
performing this work
doesn't that mean that the Russians
are getting ahead of us? I don't think...
You can use that excuse for any atrocity
that's ever been committed.
"If I didn't do it somebody else would."
But on the other hand,
you seem to be making the argument
that if any form of research
has military potential
then it is something which
morally should not be researched.
- I asked if it would bother you...
- I think you halt human progress.
You halt human progress!
Chess is black and white.
(Carbray) Let's...
again, let's take this example,
I'm not in the world,
I'm not in the world...
It's not war, chess is not war.
It's like my uncle said,
"War is death, hell is pain,
chess is victory," and um...
I would rather play a game of chess
than go fight, get killed,
get a fuckin' bullet in the eye.
I enjoy it.
- I enjoy playing.
- Here you go. Enjoy that.
Thanks.
But what about...
What about the progress of A.I.?
You talk of its applications in war,
but how far has A.I. really come?
Things evolve, this is true,
I'm not refuting that at all.
But if all computers can do is calculate,
then what about our basic
fundamental premise of intelligence?
What is artificial intelligence?
Let me stop you there for one second.
Why are you here?
To participate in a tournament,
to do the best you can,
in a field that you basically believe
is stagnant and you don't believe in?
I don't believe
in the dominant approach.
You guys figure this out.
You ever seen the knight's tour?
You've got to look at the real research.
- You do the knight's tour?
- Yeah.
You wanna see it?
- Yeah.
- Yeah, but, but...
(Visitor) So many of my colleagues, I feel,
have a very narrow view.
There's a fundamental assumption that all knowledge can be formally represented. That all knowledge can be reduced to numbers. It needs to be an embodied sense...

(Carbray) But for God's sake, you're in the academic world! If anybody — if anybody could get a grant, if anybody could get this signed off to do this kind of research, it's you. You're in an ideal position for that. I'm not. My employer probably doesn't see any money in what you're talking about, But you? You can go forth, you can put these theories into practice. You can write research papers on it.

(Visitor) You would think academia would be more promising, er... but the dominant paradigm... (John) You been recording this whole time?
- (Visitor) ...is very hard to fight against.
- No.
(Visitor) I mean, I...
(John) Why not?
(Visitor) I've gone to grad school for years, because I was seeking real artificial intelligence. And real artificial intelligence, it's...

(Carbray) Let me ask you... (John) Real artificial intelligence? Is that different than artificial real intelligence? (Carbray) How significant is the research? (Visitor) In the last decade the research hasn't been that significant, even in the calculable world. (Carbray) We're going round in circles, aren't we? (Woman) Who are you?
This is Mike Papageorge. I'm here for the competition. Could I possibly come in for a minute? (Woman) Can you go away, please?

(I COLLIE RYAN:
(Knocking)
J Hole in the bucket, the water will fall
J' Hole in the bucket, the water will fall
J Hole in the bucket, the water will fall... J
Oh, um, I lost my key. Can I just come in here and stay with you guys for a while?
- Sure, come on in.
- Thanks.
Ha.
- Ha.
- Ha.
- Ha.
- Hu.
- Hu.
- Ha.
- Ha.
- Ha.
- Ha.
(sighing)
One want to be two, two want to be one.
(Clears throat)
(Group) One want to be two, two want to be one!
(Woman) Oh, wow!
(Man #1) Yeah. It's half me and half you.
(Man #2) I didn't get absolute perfection, but I definitely see the possibilities, and being open to the possibilities. I never realised that our eyes are the same colour.
(Laughter)
And just...
Thank you.
- Thanks.
- Thank you for being here.
  (Humming)
  (Laughing)
Its warmth.
Its moisture.
- Excitement!
- Ooh...
  (Laughter)
The joy it brings.
- Oh.
- It is OK.
You may come in.
And we shall adjourn.
Should we go back to the room?
I will visit with you all individually,
and I will see you all together
this evening.
  (Whispers) I love you.
I love you.
Do you need help cleaning up?
Yes, yes, thank you...
Hey, what do you got there?
A COMPAQ luggable portable computer.
Hey, that's a big one, huh?
Yeah.
What's... what's, er...
It's the PDP-11.
- A what?
- It's the PDP-11.
OK. Wow!
Yes.
It's very good.
And how about your name, Luke?
- Is that some kind of acronym?
- OK, well... (Chuckles)
Luke is me, not an acronym.
Luke is my computer.
Luke is the software
that I wrote for this contest.
So it's all Luke.
Just me, version one.
- There'll only be version one...
- Gentlemen. Shelly.
Another round begins,
we can start the games.
Roland, I'm sorry, I'm afraid
we're going to have to offer our resignation.
Is that even legal?
To resign
before you've even made a move?
Should we ask Reini?
It's OK with us, we'll take the win.
What's wrong?
Oh, I wish I knew.
You guys need a bathroom break?
(Henderson) This is a very odd, weird,
strange, idiosyncratic game.
I don't know how many
ways I can say it.
And it's all on White,
it's all CHECKERS.
White has already sacrificed
a queen and a knight.
This is either suicide
- or just the most brilliant game...
- What's going on over there?
...of the whole tournament.
TSAR hasn't made a single move!
Hey, don't talk to him.
He's working!
Pat, go fuck yourself!
Look!
This is a beautiful, beautiful quiet move
which I just missed.
- CHECKERS set quite a clever trap here...
- Tom! Hi!
Hi! Les, good to see you.
Excuse me.
- How are you doing?
- I'm fine, thank you.
Wow, you're still using the V-20-10...
Excuse me, Les.
Tom, could you follow me, please?
- Nice position you've got there.
- Tom!
(Henderson) Tom Schoessler,
the man of the hour!
Hey, what's wrong with you guys?
TSAR 3.0 – what's wrong?
Innovation can be a rocky road!
We actually just resigned the game.
You resigned?
Why?
Peter, you want to update Tom?
It, um...
I was just up all night debugging it
and I haven't come across anything.
- You were up all night?
- Yes.
OK, um...
How about you get a breath of fresh air
and we'll work on this?
Oh. OK.
- Roland, good to see you.
- Hey, Tom.
Good to see you.
So, er, I know
this is a little unorthodox,
but between gentlemen,
do you mind if we "unresign"?
Sure. Yeah.
- I just want to watch her play.
- It's OK with us.
OK.
Hey!
Hey, are you with the computer convention
over there?
Yeah, I think we met briefly
in the conference room, I'm Dave.
- You're...?
- Peter.
- Peter, nice meeting you. Yeah.
- Yes.
Hey, do you mind
if I ask you a question?
What are you guys doing in there?
(Chuckles)
Are those all the new computer models,
or what?
No, not really.
- They're new chess programmes.
- Oh, yeah?
Various... various people have written their own chess programmes this year - and it's a tournament for that.

- OK.

So the computers will face each other off to see who's written the best programme. OK, so... the computers play chess versus other computers?

Yes.

Wow.

(Chuckles) Wow!

Well, I've got a little convention here, too. I mean, it's a couples group. I don't know if you've ever done any encounter stuff or anything like that. You're probably a little young for that.

I don't know if you're into any of the therapy at all...

Anyhow...

the guy, I don't know if you've seen this guy - Keneiloe in there? Big black guy. I mean, he's from Africa!

So his perspective is really... really heavy, you know?
I mean, his...

It's not like the western therapy trip at all. It's like, er, it's really...

Oh, man.

Are you married?
- No.
- OK, well...

I mean, all truths contain their opposite. Without black you can't have white, that sort of thing. You understand, right?

It's like in order to know something you have to forget it - that's why we seek it!

OK, OK...

I know what you're thinking, "Who's this crazy guy?"
- No, it's nothing like that.
- Yeah, no, it's OK, it's OK, it's all right!

Well, I'm Dave.

Tell me your name again?
- Peter.
- Peter, right.
- Peter Bishton.
- Peter Bishton.
- Hey.
- Yes.

Hey, we got the same colour eyes, man!

All right.

Hey, I'll see you.

(Henderson) There is an interesting tie for second place between STASIA and ADVANTAGE.

Three and a half points each.

Their only hope is that the top two teams are going to draw,

but I think that's very unlikely with CHECKERS and ALLIANCE,

two teams that are absolutely going to go for the kill.

CHECKERS and ALLIANCE!

ALLIANCE,

a kind of traditional programme,

we like what they do,

but we can kind of figure it out.

But CHECKERS...

I've talked about this several times today - very strange,

very idiosyncratic, very odd.

I talked to Mr Papageorge himself and I said,

"What language is your programme in?"

And of course, he wouldn't tell me.

So I talked to a couple of other programmers and they said, "We have no idea.

"It could be Sanskrit, it could be Pig Latin!"

(Baby squeals)

(Baby cries)

(Woman) Shh-shh-shh...

Um...Tom.
HEY:
(Whispering)
(Baby cries)
I'm sorry, can you go to the bathroom and wash your hands?
Yes.
(Water running)
OK.
Let's check her out.
OK.
So let's run a trace with test position 62.
OK.
(Rattling)
OK, keep scrolling.
OK, next page.
I just don't understand why it's committing suicide.
(Chuckles) It's not killing itself—it's a computer.
It doesn't have will.
It's running software—we wrote the software.
So there, it's going down the tree and then it's calling the evaluation function.
OK, so... keeping that in mind, when you are compiling with F77, this code...
The F77 that you're running is not the standard one.
I wrote a new compiler, specific to this hardware and this software.
- Say that again?
- So...
The compiler is adding instructions to implement the machinery of the optimizations as it's compiling the lines that you see.
OK.
So you can see those lines of code, but there's actually more being generated.
The system can improve itself
during the game - in the hash -
to run the evaluation and then
to store that evaluation in the hash.
With adjusted parameter settings...
To implement, say,
the transposition table...
Additional functionality...
That's right - everything is not everything!
- What?
- There's more.
- OK... That's kind of new.
- Yeah.
OK.
So...
Um...
How do you stay up
through these all night hacking sessions?
I mean, do you want to get a coffee
or something?
- No. No, thanks. I'm fine.
- OK.
- I'm fine, thank you.
- OK.
Um, you know, when I was in grad school
I used to do some push-ups sometimes.
Keep my blood flowing.
Yeah.
No, I think I'm fine,
I don't need to do anything.
OK, no push-ups. So...
I just don't want it to keep losing,
that's all.
I understand,
but this is an advantage for us.
Everyone down there
thinks that we're yesterday's news.
But we're getting information now
about how this system is performing
in a tournament setting,
and we've got six months
before the world championship in Lisbon,
and no one can catch up to us!
Because they haven't seen
the technology in action,
- because of this problem.
- Neither have we.
Yeah, well,
but we can go back to California
and put the boards
in the testing hardware
and test everything in isolation
based on the parameters
that you're finding here.
We have time...
But speaking of time,
I have to get back to my wife and child.
Oh, all right, um...
Thank you.
- OK. Bye-bye.
- Bye.
Thank you Dr Schoesser -
you're a great adviser and a brilliant man.
(Knocking)
Convince me not to kick your ass.
Don't kick my ass.
Why would you want to kick my ass, John?
You stole something from me.
You hadn't talked to Freddy about this?
Is he here, by the way?
Yeah, I took those drugs.
The pills.
Freddy and I talked about this -
I'm bringing you guys money for them...
John, come on,
it's just some money.
What's the big deal?
John... John?
(Electronic whirring)
(Beeping)
(Buzzing)
(Door is unlocked)
- Hello?
- Hi.
(Whispers) Hi.
I'm sorry, um...
I'm sorry...
I'm Peter from the Caltech team,
and I was wondering -
do you have STASIA here?
- Yeah.
- OK, um...
Could I run an experiment
with the two of them, if that's OK?
- OK.
- Um...
Thanks.
Thank you.
Can you help me come get it?
(Chuckles) Yeah,
let me go get my glasses.
OK.
(Electronic whirring)
Pawn A6 to A5.
Knight B3 to D2.
It's still retreating...
Hold on, sorry.
Erm, can you try something else?
Can you try just making a move
on your own?
Don't use STASIA.
Can you do your own move?
What?
Just... Just do...
Just do your own move.
On your own.
OK.
Knight, C6 to...
Just... Well, hold on.
Just think about it a little bit,
and then go.
Just give it a thought.
Pawn A5 to A4.
Pawn G2 to G4.
Now you're waking up.
Pawn E6 to E5.
Pawn F4 to F5.
Did you see that?
- It's a weird strategy.
- It's...
Yeah.
Yeah, it's revising its strategy.
Why do you think it's doing that?
(Creaking, glass shattering)
Excuse me.
Sir?
Sir, you can't sleep there.
Sir?
It actually turns out a couple didn't check in for the other conference, and I have a room available.
- Would you like it?
- I would.
- How would you like to pay?
- Tomorrow morning?
Great, here's room 302.
Just walk down the hallway, take the elevator to the third floor and take a right.
(Cats miaowing)
(Sneezes)
(Laughing) Sounds good.
Good morning.
I don't know if that's ever happened to you...
(Man) You're talking about the dream?
(Woman)
We had the same dream last night. At least I think
we had the same dream last night.
(Man) The more we talked about it, the more it sounds like we had...
- because I felt like she was there.
- Who is that?
Whoa!
Come here, honey.
(Clears throat) Good morning.
(Group)
Good morning.
Can I help you people with something?
(Keneiloe) Yes, absolutely.
What can I help you with?
(Peter) Excuse me, Dr Schoesser?
Can I join you?
Oh, OK, yeah.
How are you doing?
What's going on?
Um...
Well, I really wanted
to talk to you this morning.
Um...
I had a theory that...
I don't think that TSAR
wants to play against computers.
And why do you say that?
Well, because last night
after we were working on it,
I took it to an MIT student's room
and I had their programme STASIA
play against ours.
Wait, you wheeled it over there?
I had a student help me, yes.
OK.
And what did you do
with the MIT team?
I just had one student play their programme
against ours, that's all.
OK.
I just wanted to see another game, and...
The idea I had is, I just had...
at first the two programmes
playing against each other,
and then I had that same student
start generating their own moves, and...
TSAR at first was doing very poor,
just like it had,
and when it started playing
against the student,
it was much more aggressive
and it played...
it performed better.
I... OK, er...
But this was just
part of a game last night, right?
How many moves?
Er... twelve or so.
OK, I...
We just didn't have enough time.
I appreciate your desire
to figure this stuff out,
but I just don't think
that that's enough data
to support this theory
about computers versus human opponents.
I would like
to run some more tests as well.
This is just the start of it.
This is just a proposition I have.
It's just such an outlandish theory...
I don't... I don't...
It just doesn't make sense, and, er...
Well...
No...
It's... It's still...
There's still
some significant evidence for it...
I know it's a bit unconventional,
but, um...
There's some others -
like Nikola Tesla...
Who has been talking to you
about Tesla?
Just some person who mentioned him.
I do not think that Tesla is a good role model
for your academic career.
That is the path to madness.
Do you know about confirmation bias?
Where you're blind to all the things
that will refute your theory
and you're fixating
on the things that support it?
This is a human trait,
and it's an issue that I've dealt with
in my own work in the past.
TSAR is a very complicated machine,
it has many components,
many connections between them.
And right now, some of those connections
are going a little wrong.
Our brains...
even more complex.
And I think that
with this theory of yours,
you're making
a few wrong connections.
And I'm worried that
if you're fixating on this
the balance of wrong connections
to right connections could shift,
and at that point
we've lost our sanity.
(Baby squeals)
(Chanting) Dave!
(Shouts) Dave!
Dave!
Dave!
(Shouts) Monica!
Look deep within me
to find what is inside you.
Go.
Break through.
Come through,
Mr Michael Papageorge.
Fight through!
(Thomas) He's crowning —
watch his shoulders!
Rotate his shoulders.
(Keneiloe) Keep fighting,
Mr Papageorge.
Squeeze through...
(sighing)
I'm now going to cut your umbilical cord.
(Screams)
Breathe, Mr Papageorge.
(Screams)
Breathe, Mr Papageorge!
(Screams)
(Whispers) There you go.
Now, what is your name?
Michael Papageorge!
Yes.
Welcome, Mr Papageorge.
Group, let us greet
the new Michael Papageorge.
- Good morning.
- Good morning.
Hey, it is a good morning.
- Welcome.
- Welcome.
Black, which was winning the game,
has now gone off on this tangent,
chasing after that white king.
Can you move your arm please?
Thank you.
Chasing the king,
trying to get it up, up on the board,
and in the process
the black bishop is trapped.
There's really nothing much for it to do.
The white king,
which looks naked sitting there,
is actually in a very nice position.
CHECKERS has moved its rook up -
I'm expecting ALLIANCE
to defend this pawn with its knight.
- That was interesting.
- Yeah.
(Papageorge)
How's your room?
Yeah, it's nice.
Same as any of 'em, I suppose.
The mini-bar is half-empty.
That's a bit of a surprise move.
CHECKERS happily takes the pawn.
But, let me tell you -
that black king is in deep trouble.
(Papageorge) Do you have
a Jacuzzi tub in your room?
- Mm-mm.
- Jacuzzi tubs are nice.
- Yeah?
- Yeah.
You got one of those?
Yeah - they ran out of rooms so they had
to give me the honeymoon suite.
Mmm, nice.
Yeah, it is nice.
Just a matter of luck, I suppose.
Deeply, deeply in trouble.
Let's see what CHECKERS
comes up with.
So, Les...
When did the tables turn?
According to my evaluation,
ten moves ago I was up plus five.
But now it looks like I'm busted.
Do you have an evaluation transcript
over there?
I just get the moves on my print-out.
Well, there's got to be a record
of that evaluation somewhere.
Could I possibly get a transcript
of that after the game?
I can talk to the powers that be.
That would be great
if you could talk to the "powers that be" -
whoever they may be.
Put in a word for me, I could really use a copy
of that evaluation transcript.
I'll ask.
I'll ask for sure.
Thanks, Les.
Lester.
- Put in a word for me.
- I will. Will do.
You're welcome.
That's it.
- Thanks. Good game.
- Good game.
(Henderson) Black resigns.
Mate in one more move.
Les, I really would appreciate
a copy of that transcript.
- I'll ask for you...
- Yeah, please do.
I must say
that was a very intense game
played between
two wonderful computer chess players
- and we've seen some of the
- What just happened?
I'm talking on camera.
Could you please move?
- I'm talking to my camera.
- I understand that, but...
Please talk to my Rules Committee
over here.
- This, the... Your Rules Committee?
- Thank you, John. Thank you.
This one little guy
is your Rules Committee?
That was an amazing game,
an extremely good computer programme.
What do you think the problem is?
You just saw...
Yes, I just saw
Allied win the tournament.
You just saw...
You just saw Goliath beat David.
And you're paying 'em for it.
You're rewarding 'em for it.
This will be ALLIANCE
versus yours truly...
- ...creative programming...
- They bought great ability!
If you had that kind of resources,
you would show great ability also!
(Dave) Hey, Peter!
Hey, how are you?
No ice!
Hey, what are you doing right now?
Hey, why don't you
come say hi to Pauline?
- Who?
- My wife. Come on!
Let's meet Pauline.
- Yeah, I've been... You all right?
- Yeah.
I've been telling her about you.
Yeah.
(J' Record plays)
(Dave) Sweetie?
- Are you decent?
- (Paul) What?
I brought a friend here.
I met Peter, my friend, in the hallway.
Come on in, Peter. Hey.
Is it OK?
I'm gonna bring him in.
- Yes, yeah.
- All right.
- Oh, hi. Hi, Peter.
- This is my wife, Pauline.
- Pauline, Peter.
- Oh, welcome, welcome.
Hey, come on in.
Have a seat.
- Put you right over there.
- OK. Yeah.
(Tapping rhythm on ice bucket)
Hey, no ice.
- Oh.
- Oh.
So, I wish we could offer you
a drink or something, but...
Yeah, our guy, Keneiloe,
he just says, "No..."
"No alcohol, no dope."
Keneiloe is very strict
about that sort of thing.
Right, right. He says it's a spiritual shortcut —
unearned grace.
- Have you ever tried LSD?
- Oh, honey, come on!
Spanish Inquisition over here.
Give the boy some room here,
let him settle in.
Er, no...
(Clears throat) Er...
I've read about it though,
and I thought it was interesting how...
just a temporary hallucination
can have a permanent effect
on some people,
on their... on their consciousness,
just chemically.
I love the way his mind is...
working.
(Chuckles)
Dave's just crazy about you guys.
It's like he's a little kid
and the circus is in town.
He just wants to run away.
(Dave) It's true,
I want to run away.
Hey, let me get you something -
a soda...
water from the tap,
something like that?
I know that you've told Dave all about
your computers and your technology,
but has Dave taken a moment
to tell you what we're doing here?
A little bit.
Don't you think it's strange
that we're all here at the same time?
Pauline and I don't actually believe
there's such a thing as...
Coincidence.
- ...coincidence.
- Yeah.
We're all kind of like seekers here.
You know what I think
is so neat about you guys
is you're kind of like mental explorers.
Hmm.
You know,
I mean, with the computers
you're kind of like way out there
like Columbus,
sailing the ocean blue,
uncharted new territory.
You don't know
what you're going to find.
There may be something really beautiful
on the other side.
But Peter, did you ever ask yourself,
"How many squares
are there on a chessboard?"
It's an eight-by-eight grid.
Well, but don't you see
how limited that is?
No...
It's actually very complex when you start
to think about it as a programming problem.
Just the number of possible games
explode exponentially with each move.
It's close to 10 to 120th power,
and to try and compute all those games
might take even longer
than humanity would be around to do so.
Oh, wow.
Oh, man.
But look at the whole world -
you want to be the best chess player,
and that's beautiful, it is,
and I honour the beauty of that,
and the passion
you have to do a thing like that.
But I have to be truthful and tell you
that it also breaks my heart just a little bit,
because you could be
the greatest chess master who ever lived
and still not begin
to tap into your full potential!
I don't want to be a chess player,
it's programming...
(Dave) Right, right,
but if you're a programmer,
you know, the best programmer,
I mean, you could be the greatest...
I mean, he could be the president of IBM...
Well, Dave, he could be the President
of the United States and...
(Both) Right, and still not live up
to his potential.
Have you been with a lot of women, Peter?
(Chuckles)

**HEY:**
I think I should probably go.
Oh, come on.
Well, I mean,
if you get your kicks some other way...
Oh. Oh, yeah.
We are very open.
We're very accepting, and...
You know, I hate to say it,
but we are actually old enough
to be your parents, and...
if you want to think of us that way, well...
I don't understand
what you mean by that.
(Dave) Peter...
If you want to leave, it's OK.
- You're not gonna hurt our feelings.
- No.
(Dave) It's... You know,
it's a free country, so...
(Pauline) But, honey,
if you want to stay, that's OK, too.
But if you stay, there's just one rule.
And that is that you have to be free.
No 64 squares on a board.
No squares, no board, just...
life!
Squares.
- I think we're the squares here.
- (Laughs) Maybe.
We're just normal everyday people -
a schoolteacher and a secretary.
Why don't you just come
sit down on the bed next to us?
Just sit next to us, that's all...
(Chair creaks)
You know what I like?
I like to get the back of my neck kissed.
- (Kissing sounds)
- Just like Dave is doing.
Just so lightly that...
that it almost tickles.
(Giggles, snorts)
What do you like, Peter?
Peter, you know,
giving pleasure
and receiving pleasure...
they're the same thing.
(Whispers) Two wants to be three.
Papageorge
Freddy.
I was talking to John.
He said that you were gonna pay us.
He thought that you were
gonna win that prize, the money...
I was planning on winning that prize.
But you...
You guys worried about the money
that I owe you?
Well, we got bills.
You took pills from us.
Yeah, I got bills to pay.
All right, well...
I haven't had a chance to leave the hotel yet
to get any money.
I don't have a car.
I don't know when you guys would have
expected me to go get the money -
I've been here the whole time.
- I have a car.
- You have a car?
They got this guy there - this African guru.
I mean, I don't even know
if he really is African.
The guy's probably from Detroit
or something.
They're just chanting and ranting...
Uh, I tell you.
It's all over for the white man.
I wonder how much those people paid
for that conference anyway?
At least I got my catharsis for free.
(Clears throat) Blllaah!
Freddy!
It's marketing.
Right.
- Tom Schoesser.
- Tom?
He sold his programme to Allied Labs,
that's what happened.
TSAR threw the competition.
He sold his programme to Allied,
and they plugged it into their machine,
and that's the machine that beat me.
I mean, come on,
it's just the Turk all over again!
Instead of a man
hiding inside of a machine,
it's a programme
hiding inside of another programme.
Mediocrity triumphs again.
Always.
Just take... just take...
Just take a mediocre...
Just take a mediocre programme
and turbo-charge it.
Just take something mediocre
and turbo-charge it.

OK.

We've made some strides this year,
we've had a couple of issues
on the other hand.
I apologise to anybody here
who has had cat allergies.

Miaow!

It's not gonna happen next time,
we're gonna be in a different hotel,
don't worry about it.

So now we go onto the awards —
the real reason we're here today.

So we're gonna start with the third prize,
and the winner of course
is the STASIA team,
and that is led
by our dear friend Mr McVey.

(Applause)

You guys come up.

(Henderson) He's very generously
bringing his team up.
Congratulations to a great team.

Really beautiful programming...

This is the team that's got a lady on it —
there she is.

That's the first time for our conference
and we welcome her.

Thanks for being here.

Thank you.

The STASIA team!

(Applause)

Before we present the second prize,
we have a little surprise —
an amusement from the NOOG team.

I'm gonna get this right,
this is what the NOOG team has set up.
They wrote up a little programme,
it's up here, to run a predictive algorithm.
They charted every room
that Mr Papageorge has attempted
to stay in over the weekend.
They spit out a prediction
of what room he would end up in -
and that is Room 217.
That's the big winner.
217!
(Whispers) That's just a math joke...
a math joke.
OK. (Clears throat)
Is Mike in the room?
Is Mike here?
All right, boys or gentlemen -
or young men,
or whatever you want to call yourselves -
it's time for your refreshment.
- Thanks, Mom.
- Well, you're quite welcome.
And by the way, Freddy,
do you know Luke?
No, I don't know Luke.
Well, it's time you got acquainted.
Do you know Luke?
No, I don't know Luke.

**Luke 15:**
Try and decode this one.
So, Luke tells... these are parables,
these little stories.
Like "The Prodigal Son",
that's a parable.
There's one about the lost coin,
a woman who was
preparing for a wedding
and she had to have so many coins,
and she lost one.
And she just tore the house up
looking for that coin.
All right?
Now it's called the Holy Bible.
Well, Bible means book.
- And what does "holy" mean?
- Blessed.
(Papageorge) Mom, where is the box?
I left a little box here.
It's a small wooden box, Mom!
I haven't seen it.
I haven't seen any kind of box.
(Papageorge)
You must have moved it somewhere!
I left it right here.
Well, if I moved it,
I was unconscious.
Look... you know that shelf
your daddy built above the tub?
(Papageorge) It's a small wooden box.
It has money in it.
(Mom) Wow.
You know, there was an old man
called Uncle Otto.
And he was nobody's uncle
but everybody's uncle.
And he hid his money
in a fruit jar, sealed it..
- I don't have time for this story right now!
- ...and buried it...
- I need to find this box! It has money in it!
- ...In a horse's stall out in the big barn.
- Well, the barn caught on fire, and...
- It's a small wooden box. It has money in it!
...the whole thing collapsed.
Tin was covering up his fruit jar.
And he finally had confessed the story
to his neighbours,
y they came in and dug and looked
and never found it.
- Two years later, in some muck...
- It's a small wooden box.
- ...and some brush and some moss...
- It has money in it.
...In a creek, the jar was discovered.
It was perfectly sealed.
The money was there,
but Uncle Otto was gone.
(Henderson) Lost in a loop...
Thank you.
(Henderson)
And he's taking the cheque.
I would too.
Very inventive programme,
very bold this year.
Another round of applause for this guy.
He really is a winner.
Smile for the camera.
- And thank you. All right.
- Thank you.
OK, this marks the official end
to our tournament this year.
For those of you who are not getting
immediately on an airplane,
I advise you come around tomorrow
for a spectacular game
between the winning ALLIANCE team,
computers,
and me, a human person.
- That's it. Man versus machine. Right, Les?
- Right.
OK.
The adventure continues,
and we're gonna see
all you folks next year.
(Applause)
Thank you.
Thank you all so much for coming.
We really look forward to seeing
what you bring next year.
The adventure continues.
Are you sure I can't get you something?
- No.
- Shirley Temple?
Can you just leave me alone?
Hi, Peter.
- May I have a glass of house red, please.
- Sure.
Thank you.
Talk about complex systems.
I heard a new phrase the other day:
"Garbage in, garbage out."
You input garbage into the computer,
or the data, you're gonna get it out.
But the programme is perfect!
The programme calculated exactly what you wanted. You know? You want to know the real future of computers? Tell me.

Dating. You mean computers are going to start dating each other? — No. — Science of attraction? We'll use 'em for dating. You know, we got a couple young people here. — I want to hear this. — What attracts them to each other? I'm wondering if you could programme a computer, you know, with the inputs on these signs of attraction? — It's all about strategy. — Right.

Just like chess. (Chuckles) Here we go. Go on. — Just... — What's your strategy? Yeah? (Laughs) I don't have one. I'll tell you. When I met my wife, years ago in college, I knew her one day before we had that magical moment. So what happens with that? When people see each other and get that reaction? I mean... I mean... You're a video guy. — Yeah. — Yeah, what do you see, man? What do I see? What do you see? Yeah.

I don't know - you want to look through the camera and see what I see?
You want to look through the camera?
Yeah.
Go pick it up.
Test it out.
- You ever use a video camera?
- No.
- Check it out.
- OK.
Wow!
Wow, wow, wow.
Have you, in your dealings with the other teams, heard any rumours or speculation that the Allied Labs team paid Professor Schoesser to throw the tournament?
No.
Good.
I can tell you that that is completely false. Have you heard another rumour that there's been interest from the Pentagon in our project?
No.
That one's true. And, in fact, they've been following the project for some time. They're aware of the failures we've been having and they don't understand them either. And the reason the Professor was late to the tournament was because they had detained him for some sort of questioning.
I want to tell you something that I haven't told anyone else. And I hope you'll use discretion with this information. You know that my own work is primarily experimental psychology - broader applications or implications of the same artificial intelligence work that we're doing?
Yes.
Not necessarily having told Tom
I was doing this,
I used some of the TSAR software
in a personal project.
I was up very late one night -
in the lab running experiments -
I saw something anomalous...
something that I told myself for a long time
didn't happen,
that it was some kind of a practical joke,
or RF interference -
something deeper and stranger,
possibly more exciting!
I saw something that night
that I can only describe as chilling.
(Whirring)
(Ultrasound heartbeat)
I just thought you should know.
Thank you.
(Breathes heavily)
(Knocking)
(Door creaking)
- Hi.
- Hi.
Um... hi.
Peter, your strange ideas from last night -
they really got to me.
This morning I woke up
and everything was weird.
I walked out into the lobby
of the conference
and I looked down and everybody
looked like they were chess pieces.
I saw Professor Schoesser standing there -
he was the king,
and Henderson was zig-zagging,
going diagonals like a bishop.
And there was a student
who was stepping forward,
just like a pawn.
And just as he was about
to hit Professor Schoesser,
his wife swooped in to defend him,
just like a queen.
And I kept thinking
that a knight was gonna teleport...
Did you see any teleportation?
No.
No...
Um... did you see anything where...
like if two bodies would come together,
one of them would disappear?
No.
OK.
All right.
Well, thanks.
Er... good night.
Good night.
(Keneiloe) Hello, sir.
We are a group of hearts and minds.
Oh, I see...
That's very nice,
but listen -
you're gonna have to get out of here,
take your group,
because I have this room reserved
for a chess tournament.
There's a chess tournament in 20 minutes
and I'm bringing in chessboards,
I'm bringing in a computer,
there are 20 people coming.
So just take your group
and you'll have to leave.
Er... no, sir.
We cannot leave.
I have the room reserved.
You don't have it reserved.
I have it for the whole weekend!
Every day I have it with the management.
We've had a chess tournament
all weekend,
- people from all around...
- But today is Monday, sir.
- I know. Well, Monday is part of the...
- (Bell rings)
Yes.
Um, perhaps
we can speak with the manager?
No, no, let's not talk to the manager.
(Drumming)
Um... excuse me, people.
We have an agreement.
Shh.
(Printer clatters)
(Distant drumming)
(Printer clatters)
(Glass shatters in distance)
(Group vocalising in distance)
(Clock ticking)
Don't you people have any respect?
(Ticking stops)

(I COLLIE RYAN:)
(Breathing heavily)
J It's gonna rain down by me... J
Pat, Pat... it's OK.
Pat, forget about them.
Forget about them.
J It's gonna rain down by you
JAnd the rain comes down easy
J' But the minds of men take longer J'
(Babble of successive voices...)
- ...breaking down walls.
- I didn't see two of us, I saw one of us.
Seriously, I don't think
lever saw him the way I saw him just now.
A much deeper connection...
There was a warm communion
that came through...
I wanted to, just, take her clothes off
in that moment.
Excellent.
Did you hear what he said?
He wanted to take off her clothes...
Well, I have to think
it was my mom and dad.
I have to think it was Biblical...
- What even does the love taste like?
- Dangerous and potentially catastrophic.
I think all of us can see mates
right down the line.
No, I don't do anything like that.
- Wow. OK.
- I love doing this.
I have a million more things to say.
(Laughter, shouting)
J' But the minds of men take longer J'
Dr Schoesser, I'm very, very sorry.
Mr Schoesser...
Professor Beuscher,
I'm very, very sorry.
J It's gonna rain
J It's gonna rain down by you
J It's gonna rain
J It's gonna rain down by me
JAnd the rain comes down easy
J' But the minds of men
JThe minds of men take longer
J' Sitting easy
JSitting easy by my love
JWith the warm breathing sun above
JAnd the rising wind off the land below
J Tells the sky of a rainy child that grows
J There's an eagle hanging lazy in the sky
J' Dropping feathers down by where we lie
J And the feathers will soon die
J Giving way to a rainy child of sky
J It's gonna rain,
it's gonna rain down by you
J It's gonna rain
J It's gonna rain down by me J
This song is in honour of artificial intelligence.