The year we make contact

Review of *2010 – Odyssey Two* by Arthur C. Clarke and the corresponding movie *2010 – The Year We Make Contact* by Peter Hyams

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Johan Kwisthout, RU Nijmegen.

The enormous success of Stanley Kubrick's *2001 – A Space Odyssey* in 1968 inspired and convinced him to make a sequel in 1982, which was filmed two years later. The movie *2010: The year we make contact* starts with a mission report of Heywood Floyd, Chairman of the National Council of Astronautics, meant as a short review of the first movie *2001: A space Odyssey*. In the distant future – the original movie dates from the time before Neil Armstrong sets foot on the moon – a large monolith of unknown composure or origin was found on the moon, buried under moon sand. The age of the surrounding rocks proved that it has been awaiting events there for four million years. When it was finally excavated and perceived light for the first time in millions of years, it transmitted a shriek signal to the surroundings of Jupiter. A space mission was established to investigate the destination of the signal. Commander David Bowman and co-pilot Frank Poole were accompanied by three scientists (in deep hibernation) and HAL 9000, an artificial intelligent computer that more or less controlled the spacecraft *Discovery*. Apparently, on arrival at Jupiters' moons, HAL turned berserk, killed the scientists by shutting down their life support, killed Poole by attacking him in space using his own spacepod, and nearly succeeded in killing Bowman as well. Bowman, having outsmarted HAL, shut down his circuits and went on to investigate the monolith. His last words: "My god, it's full of stars".

The sequel *2010* picks up nine years later. Floyd, being dismissed as chairman following the fatal space mission of the *Discovery*, is approached by a Russian colleague, who succeeds in convincing Floyd that a combined American-Russian mission is needed to be successful in returning to Jupiter and collect the data still stored in *Discovery*. Eventually, Floyd, the technician Curnow, and HAL-specialist Chandra, join a Russian team on board of the *Alexei Leonov* spacecraft onwards to Jupiter and the mysteries of the Monolith. It's an uneasy alliance, since the US and the USSR are in state of conflict in Honduras. However, when Floyd and one of the female cosmonauts, both terrified by dangerous aero-breaking manoeuvres to get rid of excess speed, lock themselves up in Floyds' cabin, things sort out at least on a personal level

The crew manages to dock with Discovery and Chandra is able to revive the disconnected HAL. The investigations on the monolith by the crew have little effect and when the US and USSR become technically in state of war, the *Alexei Leonov* and the *Discovery* are ordered to leave separately for earth with their respective crew when the launch window opens. But then HAL clears his electronic throat and announces an incoming message for Dr. Floyd, stating that they must leave immediately as something gigantic is about to happen. Which is awkward, since the only way to do so – use the *Discovery* as a first stage booster for the *Alexei Leonov* and then dismissing the craft – would imply the destruction of *Discovery*. No-one is happy to inform HAL of his imminent fate, yet they need his full cooperation to get out of there.

2010, the sequel to *2001*, includes both the original actors playing Bowman and Floyd, as well as the voice-over of HAL. As was the case with *2001*, the movie is accompanied by a book by Arthur C. Clarke. But the similarities stop there. Whereas *2001* (the book) was written together with *2001* (the movie) in a joint effort by Clarke and Kubrick, *2010* (the movie) was filmed after *2010* (the book) was published. Where *2001* was reviewed as a superb science fiction movie and is one of the must-see films for every AI-student, 2010 received less critical acclaim. Hyams, the director of 2010, misses the genius of Kubrick and violates the laws of physics for spectacular special effects. For example, in the vacuum of space, there are no giant explosions, stars don't move and nothing is to be heard. Although perhaps inconvenient for the casual viewer, Kubrick acknowledged such facts while Hyams doesn't. Also, Hyams adds an annoying layer to the movie which is lacking in the book: the cold war, of course eminent in the early 1980s, extends to the spacecraft, while Clark's characters in the book showed more mutual respect despite their different origins. The storyline in the movie is sometimes rather thin, while the book is much more imaginative and a good example of Clarks' style and theme. By all means, when you plan to see the movie, read the book as well.

But lets not to be too hard on *2010* by comparing it with *2001,* which resides in a category by itself. Probably both movies, *2001* and *2010*, are a trademark of the time they were filmed. The special effects in 2010 – like the views of Jupiter and Io and the *space-trip* from Leonov to Discovery – are really great, measured by the standards of 1984. The movie was nominated for a number of (minor) Oscars but won none of them. Nice to know: both Clarke and Kubrick make short appearances in 2010.

Interesting is the role of the AI in the movie 2010. We are confronted with Dr. Chandra's personal feelings of affection towards HAL, and on the other hand the view of the other astronauts: "it's merely a machine". However, Chandra insists that HAL owes respect as any other conscious being, whether they are made out of silicon or carbon, and decides to tell HAL the true cause of their early departure. Also we observe HAL's conscious decision to help the crew towards Earth although it will cause its own destruction. We learn that HAL was suffering in 2001 from a so-called *Hofstadter-Mobius-loop*[i] and that his psychosis resulted from conflicting goals: he knew everything about the real purpose of the mission – to observe the monolith – but was not allowed by the US government to reveal anything to the crew as panic would spread. When HAL prevents radio contact with Earth, Bowman and Poole became suspicious and threatened to disconnect him. For an AI this is the equivalent of death, and a violation of his primary goal with respect to the mission: to observe the monolith. He cannot allow to be disconnected, yet also cannot allow the crew to have radiocontact, as that would have them find out what the real reason of the mission is. His only way to manage all goals was by killing the entire crew!

As in 2001, HAL is in *2010* again a conscious and intelligent entity, which was pretty much as AI foresaw its future in the 1960s and (maybe to a lesser extent) in the 1980s before *Jerry Fodor and his Frame Problems* scored a monster hit[ii] and crushed all hopes of a logic-driven, fully rational, fool-proof and incapable of error artificial intelligence. But then again, who wants a computer that *enjoys working with humans*, but in the end decides to eliminate them all?

Referenties:
2001: A Space Odyssey (film) (Stanley Kubrick, 1968, 141 minutes)
2001: A Space Odyssey (book) (Arthur C. Clarke, 1968, 320 pages)

2010 – The Year We Make Contact (film) (Peter Hyams, 1984, 114 minutes)
2010 – Odyssey Two (book) (Arthur C. Clarke, 1982, 291 pages)

[FRAME]
Three reasons why *2001* is a good science-fiction movie

Q. I watched this supposed-to-be classical AI-movie, but I find it rather boring and, most of all, slooooow… How come everyone is praising this movie?

A1. *2001* is *true* science-fiction. While the fiction is, er, fictional, the science is sound. No single law of physics is broken in the movie. In space, when you fire your laser at an alien spacecraft, you won't see any laser beams nor hear a thunderous explosion, because we're in a vacuum. Whereas most directors would sacrifice that fact to add some cool visual effects, Kubrick doesn't, and even hired a scientist on the set to make sure that everything that is depicted could possibly happen in reality. And yes, the movie is slowly progressing, as most 1960s movies were.

A2. HAL captures both the expectations (an artificial brain that outperforms humans) and fears (what if it would turn against us?) that scientists and the general public had in the 1960s. For example, HAL played chess well enough to beat a human, which was unheard of in the 1960s. At that time, chess was considered extremely difficult to do well by any computer, and typically something to demonstrate men's superiority over computers. Furthermore, HAL is not only intelligent, but also conscious, gifted with knowledge about almost anything, and showing emotions like being anxious and fearful. At the time the movie was released, this was visionary.

A3. The movie is packed with detail. Take the chess game between HAL and Poole. People have analysed this game[iii] and it turned out that HAL plays humanlike, rather than using a *minimax* algorithm: HAL plays in order to lure Poole into a trap a checkmate him. Also, when the checkmate is inevitable, HAL chooses to play one of the most interesting chess sequences rather than the fastest checkmate. Without doubt, Kubrick picked this chess game – rather than any standard game – deliberately. Furthermore, HAL makes an error when describing his move "Queen to Bishop three" while he actually plays "Queen to Bishop *six*". It is still a mystery whether Kubric just erred or made a deliberate choice. It is because of these little mysteries that, in my opinion, 2001 indeed is *the* seminal AI-movie.
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[i] *Hofstadter-Mobius-loop*: A (fictional) error condition, according to Clarke, common to advanced computers with autonomous goal-seeking programs such as HAL 9000. It can occur when the computer is given a directive in conflict with its basic design principles, and is unable to resolve the conflict. The symptoms are very similar to a schizophrenic psychosis in humans. *Source: everything2.com.*

[ii] Regardless of his stubborn refusal to appear on *Top of the Pops.*

[iii] Referentie: *An enjoyable game: How HAL plays Chess*. Murray Campbell, in: David Stork (Ed.), HAL's Legacy: 2001's Computer as Dream and Reality, 1996, MIT Press.
http://mitpress.mit.edu/e-books/Hal/chap5/five1.html