

Supplement III:6-4

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509	conspiracy theory around GEO, a group of billionaires and their meetings. Roy McGill
515	critical software : QJS - qualitative jury selector
517	artificial intelligence
521	Zodiac-style serial killer, another Roy McGill episode
605	biotech company
606	UFOs, air bases...
607	hacker episode : PenTest conference, white hat vs black hat, etc.
610	D.B. Cooper (“the most famous unsolved crime in American history”)

Table 1: episodes

504	Charlie starts working for the FBI again
c. 501-05	Don starts visiting the temple
520	Charlie upgrades to a new office at CalSci
522-23	kidnapping
601;616	marriage proposal and marriage

Table 2: main events

502	scheduling algorithms
510	cold-boot attack
522	John Conway’s angel problem : “an angel stands in the middle of an infinite chessboard while devils attempt to block her way”

Table 3: theories

502	1m	“John Conway and Steven Sigur wrote a great book about that subject” [the triangle]
503	34m	<i>The Nature and Growth of Modern Mathematics</i>
509	?	unidentified
510	3m	<i>Scientific American</i> (?) + un.
	8m	<i>Trigonometry 1</i>
	23m	<i>CRC Standard Mathematical Tables and Formulae; Network Security</i>
	29m	<i>Information Systems</i>
511	30m	<i>Popular Science</i> (another issue?)
522	6m	<i>Out of Control; The Illustrated Guide to TECHNOLOGY</i> + un.
605	20m	<i>SMJQ</i>
612	11m	<i>Multinational Journal of Mathematics</i>

Table 4: books

In season 5, Don turns towards religion - this comes in addition to Larry’s spiritual quest. Charlie remains a staunch defender of science while Larry is trying to find a balance between the two. Amita, it turns out, is open to conspiracy theories and David/Colby well versed in the JFK case [509]. This transition,

begun in season 4, makes *Numb3rs* resemble X-Files more and more, compared with the first three seasons' stronger focus on mainly science.

Ep. 9, entitled 'Conspiracy theory' is one of the best episodes in a long time, in particular the character of Roy McGill (who, wisely, makes a return in ep. 21). McGill and his "truth cave" are reminiscent of Lone gunmen.

Ep. 15 highlights critical software used in key fields of society with the case of a program called QJS, qualitative jury selector, used to automatically select optimal juries; developed by a company called JuryFind. A plot development is that a software patch has been installed suspected to have changed the outcome of a trial by enabling de-anonymization and tampering with the jury. It is clear from the descriptions that one is dealing with commercial proprietary software.

Ep. 17 is another clone of a classic technology x-files : on the surface, the story of a murderous artificial intelligence having reached a degree of intelligence and autonomy great enough to also have developed a sense of self-preservation; When a computer scientist tries to restrict them, they kill their maker in a sort of modern Frankenstein tale.¹

The decors of the episode are a mix of concrete and metal, and a combination of cerulean blue, orange and neon green illuminations; evocative of an imagined future.



II. [r.] Jane, DoD spokesperson

The artificial intelligence is a DoD project developed by a private company. In *Numb3rs*, and elsewhere, federal projects undertaken at private contractors are a recurrent setting for accidents, crimes and other unusual developments.

It is described as a "*silicon-based life-form*" and "*government-owned prop-*

¹(In visual popular culture this plot, in its most basic form, goes back to several movies of the 1960s-70s in which Cold War fears and paranoia of rogue weapons were expressed; while in science fiction more generally the theme is likely older. e.g. Project Odin, Vinge novels, singularity etc.)

erty". Instead of lofty, idealistic goals of technology working for the benefit of humanity, its applications are weaponry specifically thinking weapons (conforming to military funding and interests). A DoD spokesperson however is able to put a patriotic spin on the idea somehow, (the American lives saved!). The character of Jane Karellen and her ingenuity if nothing else deserves a salute ; She prefigures the rainbow turn and all-inclusive marketing of Pentagon, GCHQ and other agencies that would climax in the following decade of the 2010s.

J.K. - The Baley Project. Artificial intelligence. Steel Cave Robotics is attempting to create the first silicon-based life-form that can think for itself.

(...)

- So, this is a military artificial intelligence project?

J.K. - Yes.

Just imagine the applications.

Tank, missile, airplane... that can think.

We'd never have to put another American soldier in harm's way.

[3-5m]

Charlie believes that the most likely candidate to achieve - true - artificial intelligence is the American Department of defense. In this story the supercomputer passes the Turing test.

CHARLIE: Listen, if anyone's going to be successful, it's DARPA. They have unlimited funds, a mandate to invent the future.

AMITA: I mean, they're responsible for GPS, stealth technology...

[10m]

Larry tells of the dark side of accepting DARPA funding - as a warning tale, as the DoD is attempting to poach Charlie.

"I brought her an idea for a space-based telescope rig. I spent four years perfecting it. As soon as I left the project, they used it as a component in the Star Wars program. They weaponized my telescope."



II. [1] company offices [2] “smart home” of the murdered computer scientist

Numb3rs' conservatism does not stop in season 5, with an episode on so-called “animal rights extremist groups” (having already done an episode on ecological 'extremist' groups previously) [519]. This leads quickly to ludicrous plot developments about vegans...

Terrorism, once more, is connected to mental illness as if this subtle analysis and message had not already been communicated broadly enough.

Some of the best episodes of the show are found in season 6 : 605 through 607 are a series of excellent technology focused episodes.

605 is a worthy technology episode on biotech ; a private pharmaceuticals company has achieved human cloning after hiring a top geneticist... The company, called LEBENS² has a little army of private security, while their main researcher on the program represents the oh so very dangerous combination of scientific prowess and amorality.

A professor, Lazlo, presumably a biologist, recruited from CalSci for the case raises important questions

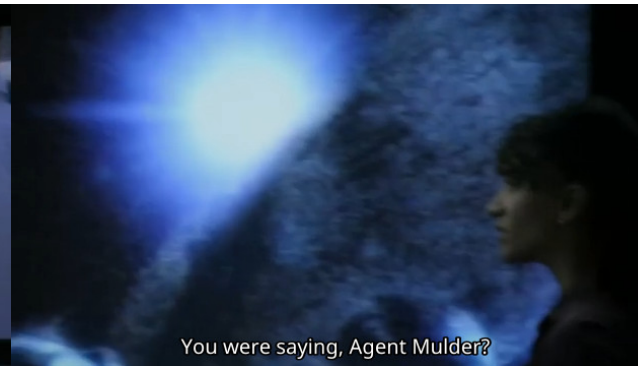
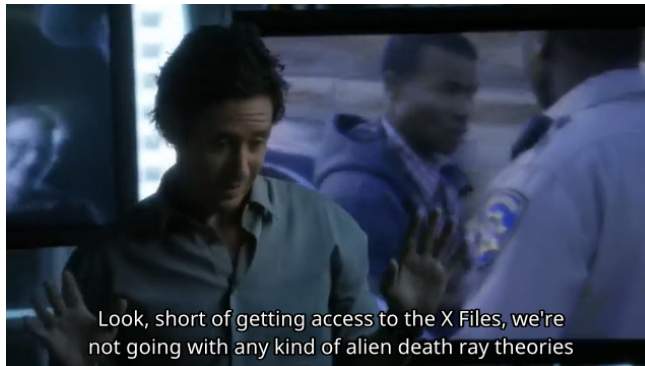
“What legal status does a clone have? And for that matter, the surrogate mother of a clone.”

As the show approaches its end it also loses all remaining restraints applied so far, intended to keep *Numb3rs*' niche identity as a science based FBI show from overlapping with *The X-Files* :

in 606, titled ‘Dreamland’, UFOs, secretive military programs, conspiracy groups and the whole paranormal tool kit is unpacked, unleashed.

The story centers on an air force base described as “the new Dreamland. The new Area 51.”

²possibly a play on BAYER, or another of the German chemistry giants.



II. X-Files reference in *Numb3rs* [S6e6]

The writers of the show are aware of the similarities and at last make an explicit reference to the classic series around 5 minutes : Don rejects any unusual explanations such as alien death rays when unexplained footage emerges... A company with a Defense contract, Neox Industries, is once more at the center of intrigue, developing a project involving plasma physics this time.

The character of Floyd, a mysterious auditor from an even more mysterious Department 44 at the Pentagon, is a particularly well-done character, reminiscent of *Twin Peaks* (especially the oddball supervisor played by Lynch himself).

The weapon of the crime is a military drone,

CHARLIE:

Looks like an unmanned drone.

FLOYD:

Ah, MK-15 Shadow Hawk.

National Aeronautical Dynamics.

First flight, February 2, 2008.

Principal user -- United States Air Force.

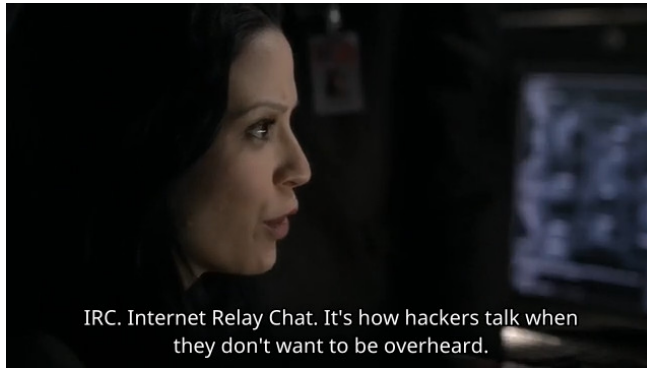
Unit cost : 12.5 million U.S. dollars.



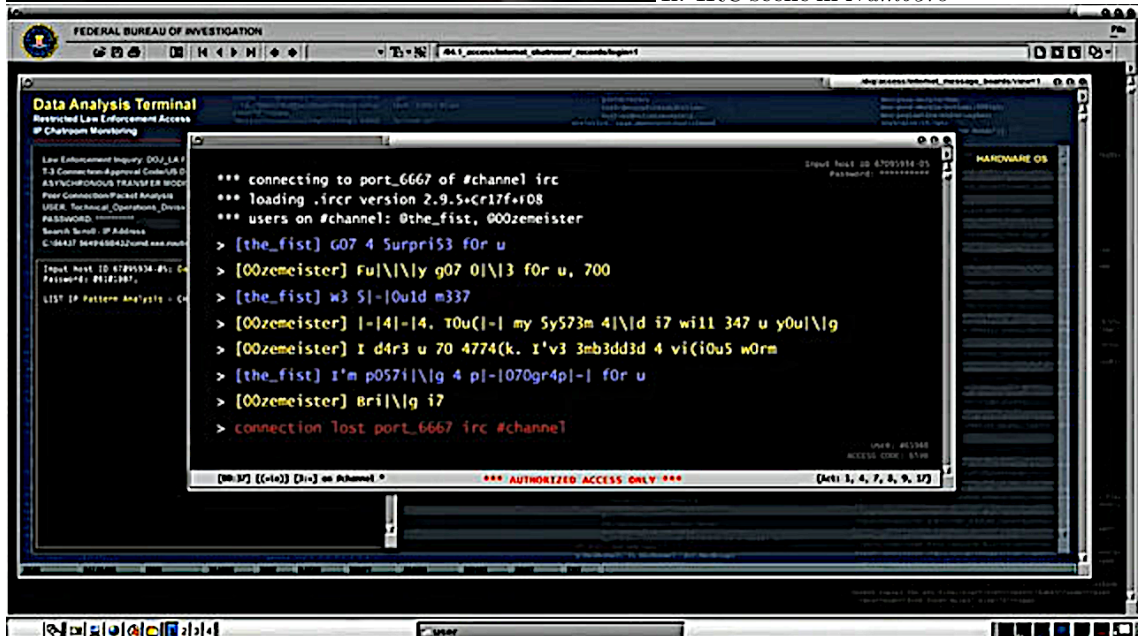
607 is a continuation of the technology theme of prior episodes, based around hackers : a central topic is the discussion of white hat and black hat hacking, represented respectively by the characters of Augie, who sees himself as an “altruistic hacker” and The Fist, an Israeli cracker; although Charlie insists identities are not always fixed. Augie later receives an offer from the NSA.

A notable moment happens in this episode, when Amita describes IRC as “*how hackers talk when they don’t want to be overheard.*” together with explanations about “no records of exchange” or awkward depictions of leetspeak.

NCIS had two people typing on the same keyboard in a meme worthy depiction of hacking : Numb3rs has its own, equivalent moment in the form of the IRC scene.



II. IRC scene in *Numb3rs*



[bottom] leetspeak : "G07 4 Surpri53 4 u"...

The not very elaborate moral of this episode appears to be that online acts have real consequences... The discussion between Amita and Charlie, happening at the end, however is illuminating :

- he blurred the boundaries between the virtual and the real and found his morality compromised.
- The neurochemical pathways in the brain are the same for an image experienced in reality and one seen in a virtual 3-D world.
- In other words, the virtual is alive and real in our minds.
- Well, that's how images from dreams can get mixed with actual memories.



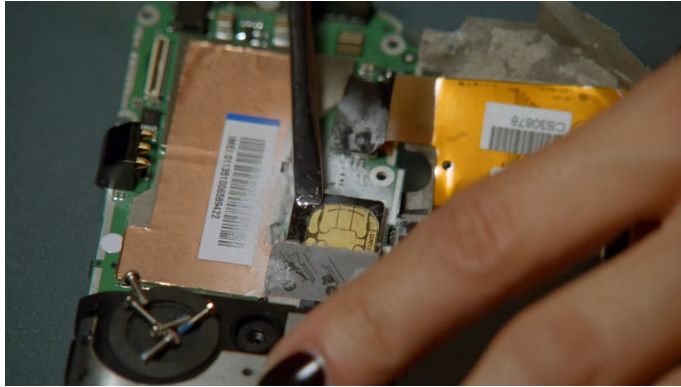
II. *Numb3rs* 607 : [1] at PenTest

Numb3rs continues to be a valuable indicator for technological changes in society ; in season 5, ep. 15 Facebook is mentioned at a time when it was (just) “over 100 million people” and its user base was associated primarily with young people, hence Allan’s insistence that “*It’s not just for kids.*” In season 6, ep. 1 DSL connections enter the show’s world. Finally Twitter is mentioned [s6e3] : Colby’s enthusiasm about the new social media stands in contrast with David’s common sense rejection and disgust at the idea ‘hell no’ [26m]

- D. - About me signing up for Twitter?
- C. - Yeah.
- D. - (...) hell no.
- C. - I’m just saying, man, if I’m out at a bar, having a few beers, having a good time, I tweet, you read it, then you come on over and join me.
- D. - Dude, if you want to have a drink, you just call me.
- You "tweeting" me - ugh. I don’t even like the way that sounds.
- C. - All right, whatever. Just keep on living in the 20th century.

The iPhone is brought up in that same episode. When Alan – a retired planner forced out of retirement in anticipation of financial need – tries to find work he realizes current jobs in his field require, advanced, computer skills. Charlie comments ; “*it’s been a little more trouble than he anticipated because these, uh, design firms, they require CAD proficiency now.*” [s6e4] Exasperated by the software, Alan says he could draw plans by hand in half the time.

Numb3rs is once again close to, (then), current developments with its inclusion of a cold boot attack in 510.³



II. Amita performing a cold boot attack in *Numb3rs* [S5e10]

In season 5, ep. 9 CalTech’s arguably most famous prank - the Hollywood sign modification - is alluded to except that it is now taking place in the present.

At CalSci, Charlie moves into a prestigious new office following in the footsteps of distinguished previous occupants (Biederman, S. Newberry, R. Knox and Hightower).

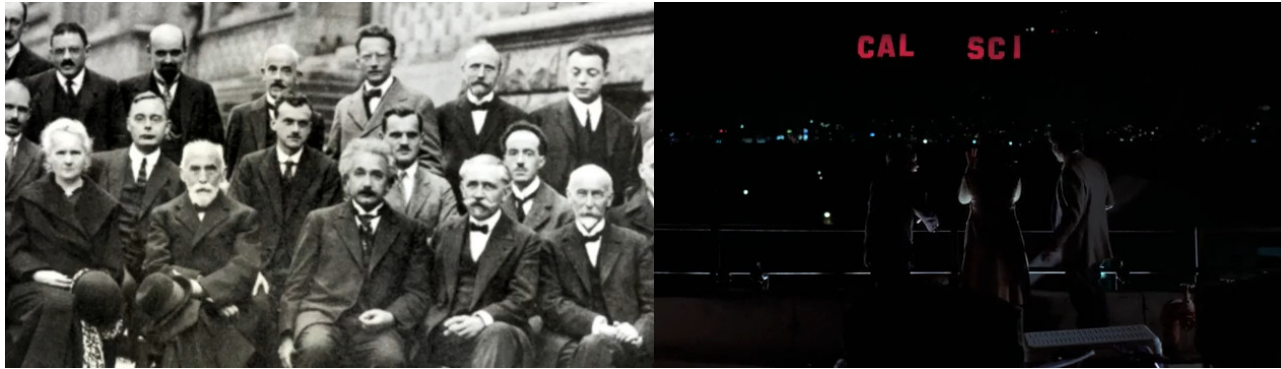
The hacker tradition of tunnel exploration is demonstrated at the beginning of season 6 ep. 2, when Larry explains,

“Absolutely not. Cal Sci tradition holds the only way you can turn a paper in late is to make your way through these tunnels and find a way to your professor’s office.”

Previously Larry had lived in the tunnels.

History of science remains present with the inclusion of the group photo featuring Einstein, Bohr and Curie at the Solvay Conference in season 5, ep. 20.

³including a competent explanation : “*Normally, when I remove the memory chip, all the data stored in it will be lost instantly. But if I freeze it first... the data remains readable, for sometimes as long as several minutes.*”



II. [1] Einstein et al. Solvay Conference photo [2] Hollywood sign prank

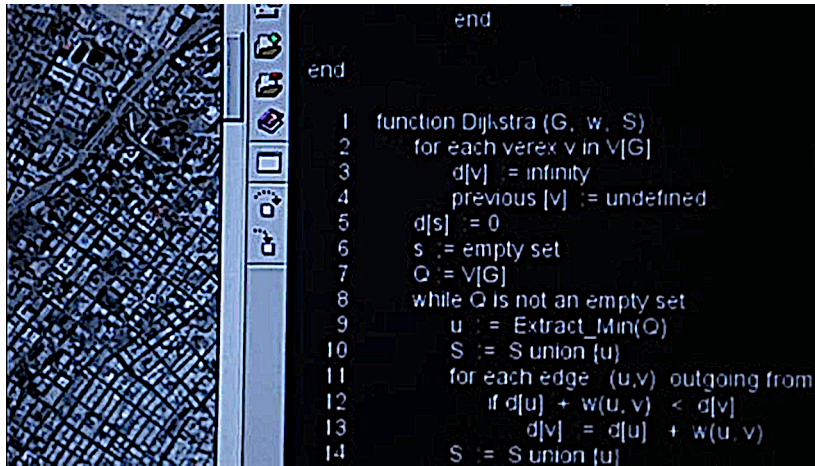
Beyond the largely episodic nature of the show, elements of continuity are found in Charlie's long term mathematical quests ; P vs NP followed by a theory of cognitive emergence.

Referring to the P vs NP era, David says retrospectively ; "*he buried himself in an unsolvable math problem.*" [s5e21]. The cognitive emergence work finally reaches a new milestone in 520, but police work gets once again in the way. By the show's end it is unclear if a working theory was able to be produced.

Numb3rs' treatment of LGBT themes - when at all present - is awkward or retrograde, certainly not record setting : Its world is a fantasy one where near everyone is heterosexual. Neither major nor secondary characters are LGBT; for most of the first 3 seasons non-heterosexual people amazingly do not exist. Kapil, a gay man from India and childhood friend of Amita, at the end of season 3 and Kath (Alan's boss), a Lesbian or bisexual woman at the end of the last season have brief roles. Otherwise, the viewer is served with mediocre jokes about David and Colby's close friendship and absence of girlfriends... As if in bad conscience, another gay male side-character was included in extremis in season 6 (ep. 9).

As for theories and technology featured in these latter episodes : a few examples :

Ep. 20 of season 5 has code for a function named `dijkstra` - for Dijkstra's algorithm (with three parameters "G, w, S") written in pseudo code, a more verbose Python of sorts.



Scheduling algorithms are explained in 502 : “*computers use them to weigh the duration or difficulty of certain tasks against the system’s resources and then allocate them accordingly. (...) no one has come up with a perfect one yet. (...) there are thousands. The Smith rule, the O2, the Beam search.*”

About the use of primes in encryption, from an earlier episode [105] : “*But for encryption, we don’t use just big numbers. We use big numbers that are built by multiplying large prime numbers, because, see, primes are the basic building blocks of mathematics. And as far as we know, they occur at random intervals along the number line.*”



II. McGill and “truth cave”