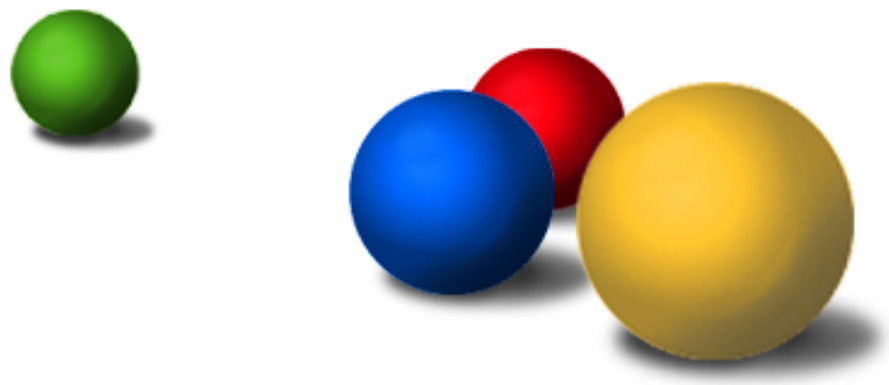
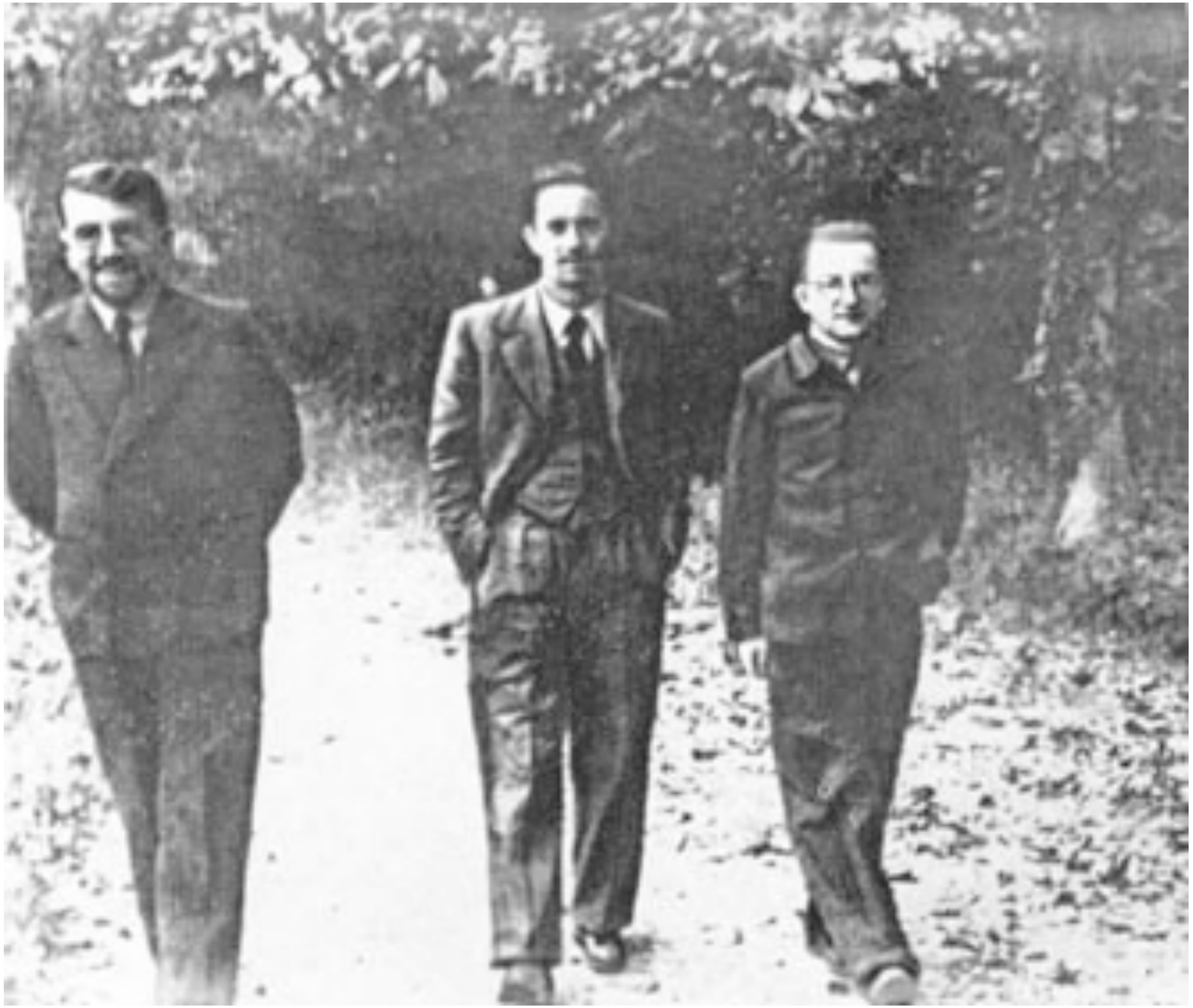
Google™

From Real-Life to the Classroom

Doug Aberdeen





Henryk Zygalski, Jerzy Różycki,
Marian Rejewski

Jan. 24, 1928. 1,657,411

A. SCHERBIUS

CIPHERING MACHINE

Filed Feb. 6, 1923

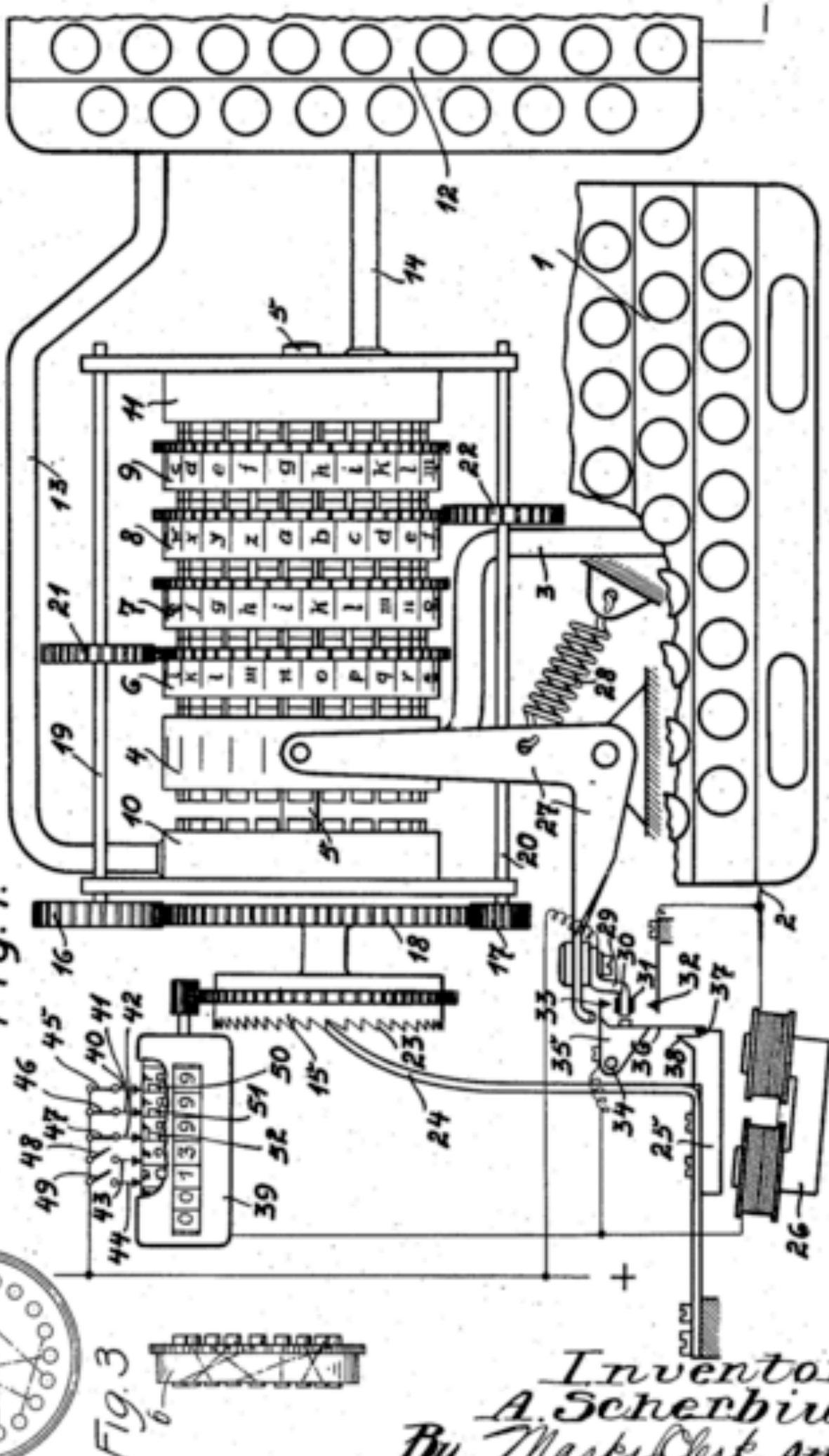


Fig. 1.

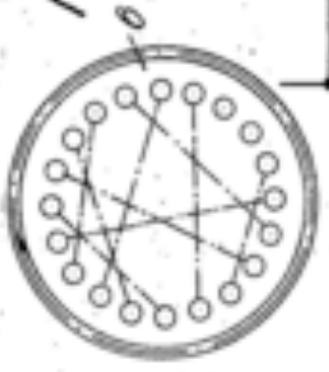


Fig. 2

Fig. 3

Inventor
A. Scherbius,
By Marks & Clerk Attys.

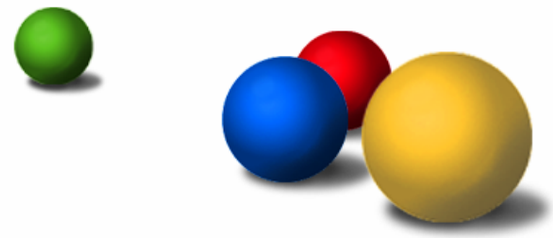
➡ enigmaco.de

➡ 10^{114} combinations for unknown wiring (380 bits). 10^{93} years assuming 1T combinations/s.

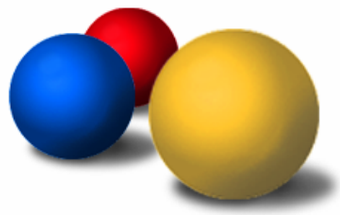
➡ 10^{23} combinations for known wiring (76 bits). 3170 years.

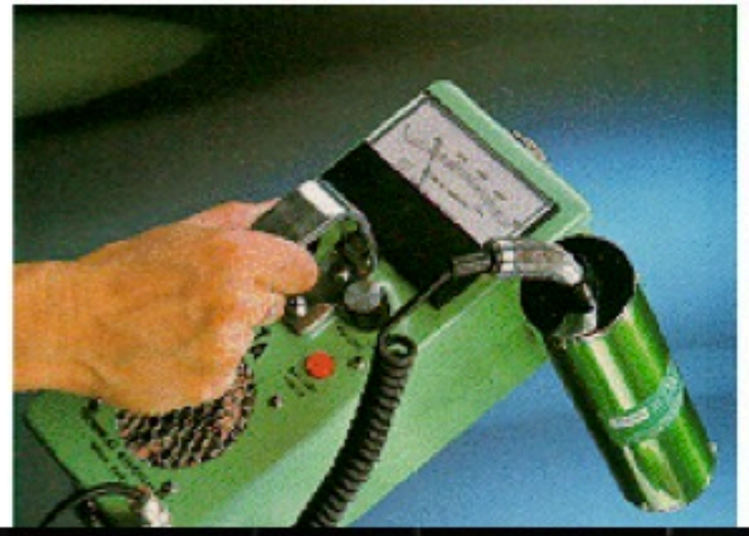
➡ Procedural errors further reduced the search space.

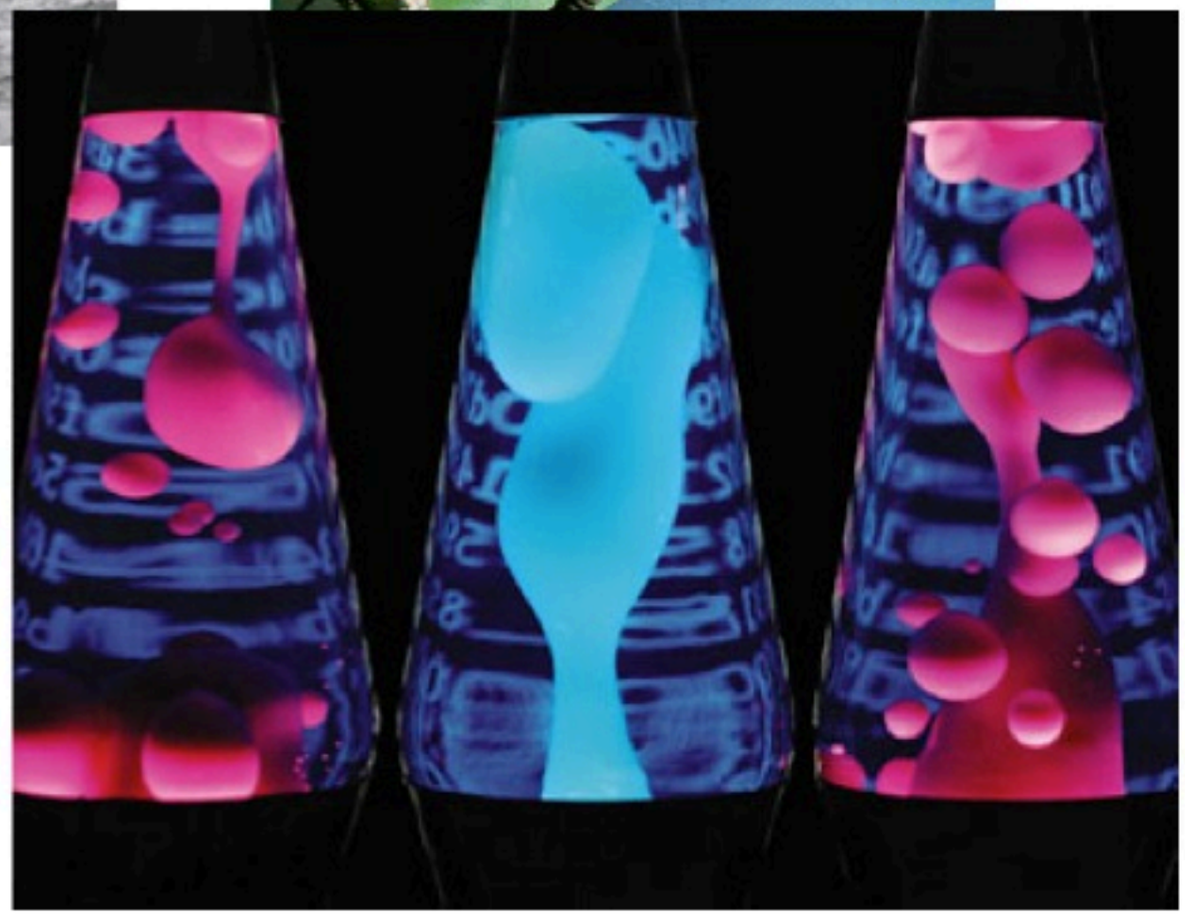
➡ "Bombe" automated the search.

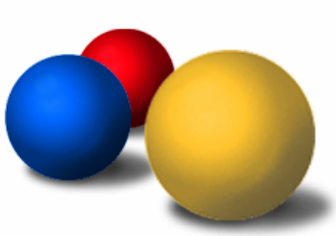


- Codes
- Circuits
- Combinatorics
- Search spaces
- Base 2
- Information theory



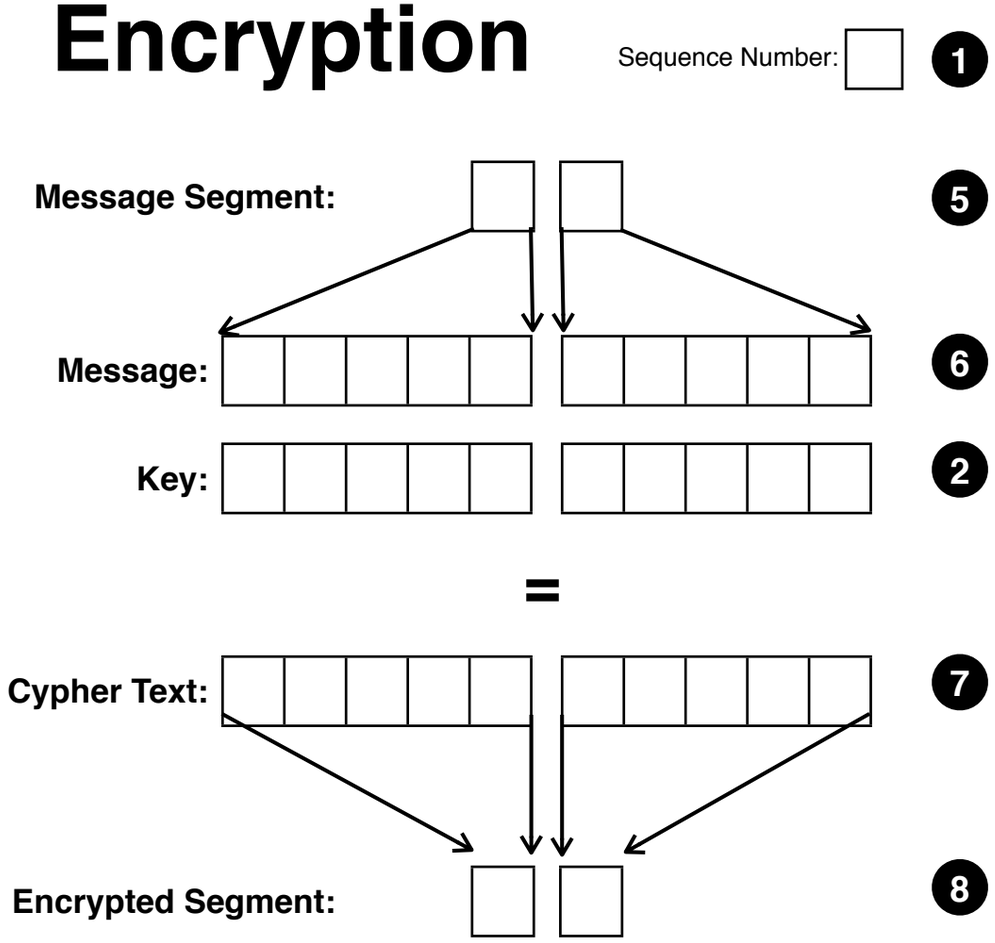






‘A’ = 00000
‘B’ = 00001
‘C’ = 00010
‘D’ = 00011
‘E’ = 00100
‘F’ = 00101
‘G’ = 00110
‘H’ = 00111
‘I’ = 01000
‘J’ = 01001
‘K’ = 01010
‘L’ = 01011
‘M’ = 01100
‘N’ = 01101
‘O’ = 01110
‘P’ = 01111
‘Q’ = 10000
‘R’ = 10001
‘S’ = 10010
‘T’ = 10011
‘U’ = 10100
‘V’ = 10101
‘W’ = 10110
‘X’ = 10111
‘Y’ = 11000
‘Z’ = 11001
‘.’ = 11010
‘!’ = 11011
‘?’ = 11100
‘,’ = 11101
‘-’ = 11110
‘#’ = 11111

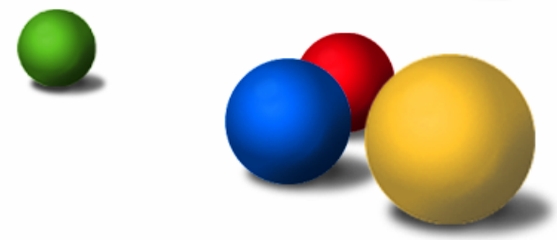
Encryption



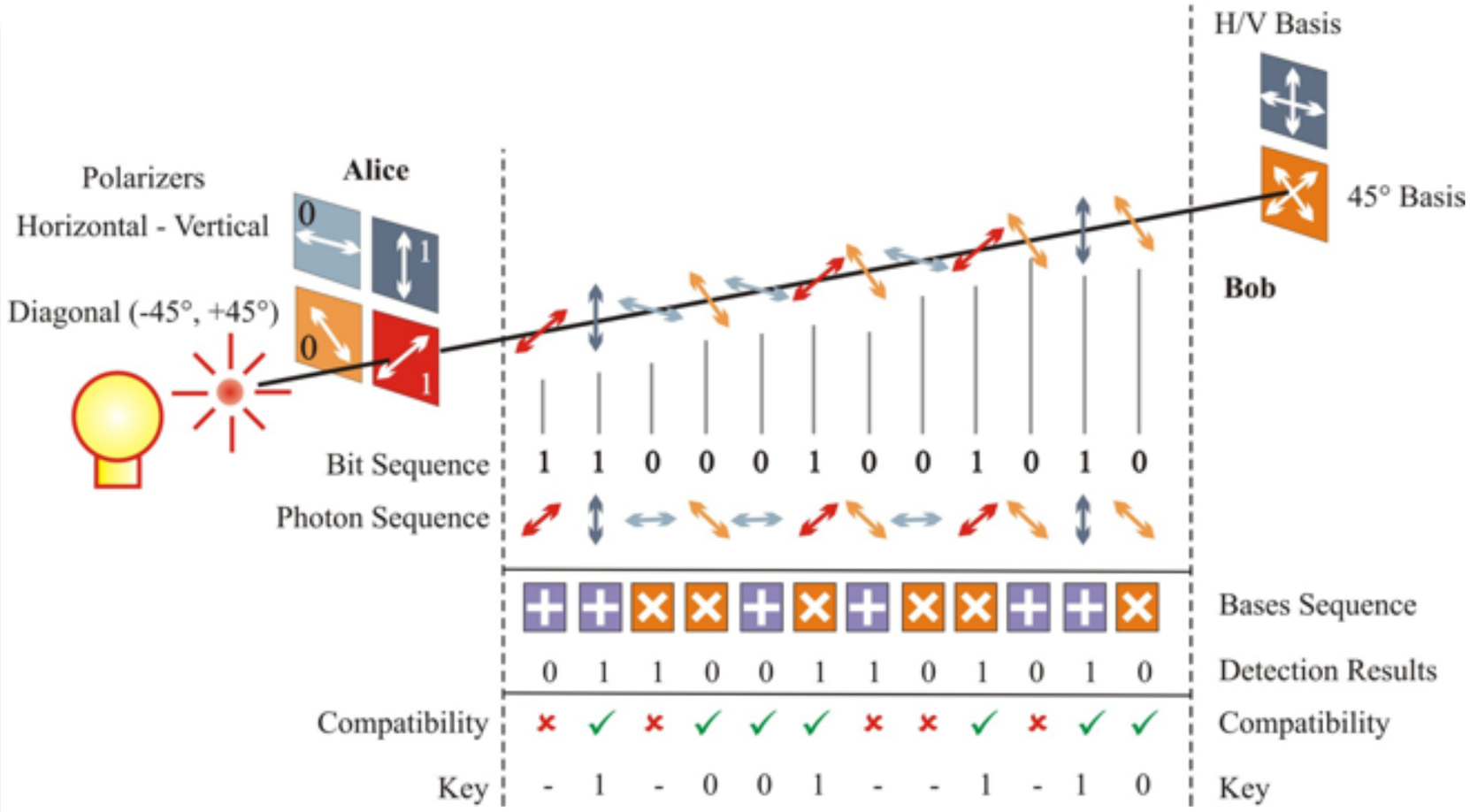
Encryption				
Text:	0	0	1	1
Key:	0	1	0	1
Message:	0	1	1	0

2 - Create your *key* segment by flipping your token and write it in the *key* boxes above.
3 - Copy your *key* segment onto your group **encryption key** sheet.
4 - Your group should create a *message* on the **plain text** worksheet.
5 - Copy your segment of the *message* onto this worksheet.
6 - Convert your two letters into binary using the table above.
7 - Encrypt the 1’s and 0’s of the *key* and *message* together using the table above.
8 - Convert your *cypher text* to letters using the table above.
9 - Copy your encrypted segment to your group **encrypted message** worksheet.

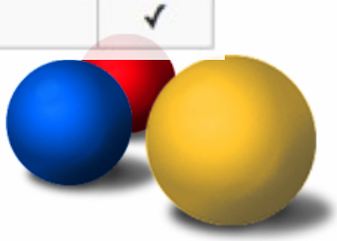
- Codes
- Circuits
- Combinatorics
- Search spaces
- Base 2
- Information theory
- Pseudo-random numbers
- Probability
- Binary arithmetic
- Logic gates
- Encoding text



- Codes
- Circuits
- Combinatorics
- Search spaces
- Base 2
- Information theory
- Pseudo-random numbers
- Probability
- Binary arithmetic
- Logic gates
- Encoding text
- Optical transmission
- Polarization
- Quantum computing

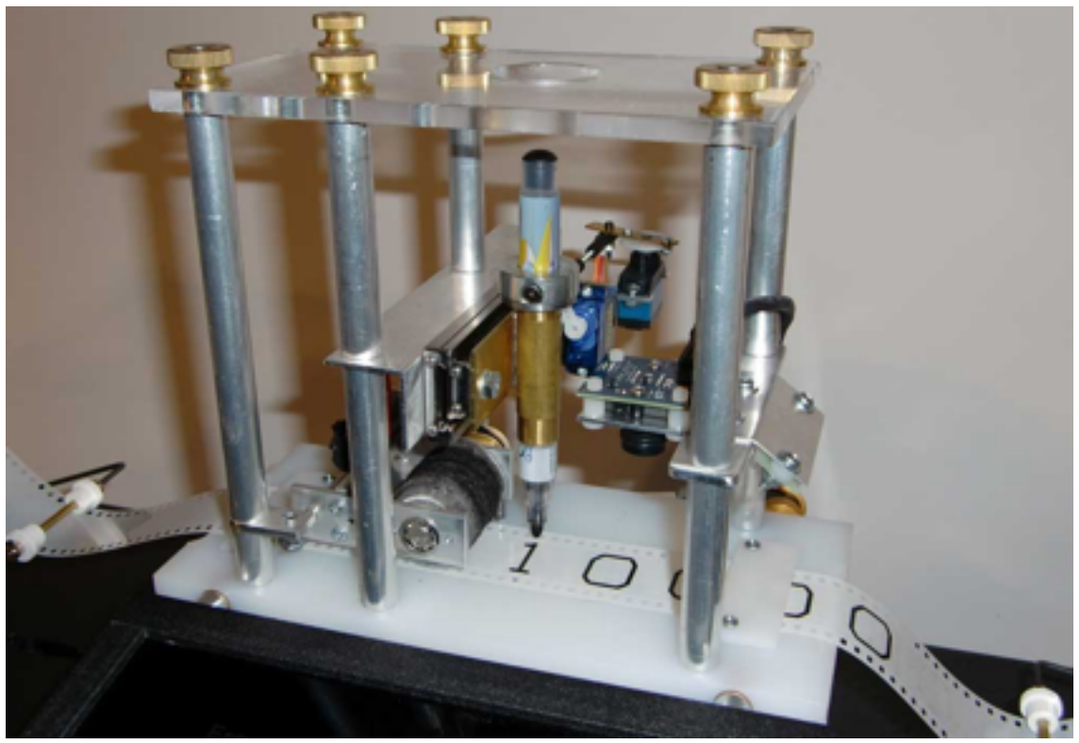


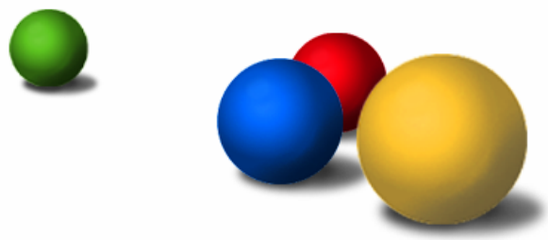
Alice's random bit	0	1	1	0	1	0	0	1
Alice's random sending basis	+	+	×	+	×	×	×	+
Photon polarization Alice sends	↑	→	↘	↑	↘	↗	↗	→
Eve's random measuring basis	+	×	+	+	×	+	×	+
Polarization Eve measures and sends	↑	↗	→	↑	↘	→	↗	→
Bob's random measuring basis	+	×	×	×	+	×	+	+
Photon polarization Bob measures	↑	↗	↗	↘	→	↗	↑	→
PUBLIC DISCUSSION OF BASIS								
Shared secret key	0		0			0		1
Errors in key	✓		✘			✓		✓



What's the point?

- Tell the human story.
- Demonstrate the *IMMENSE* impact of tech.
- Dive deep.
- Computers can only do three things.
- Most stories can teach the fundamentals.





Google

Toolbar PageRank 10/10

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Toolbar PageRank 4/10

Toolbar PageRank 3/10

Toolbar PageRank 2/10

Toolbar PageRank 1/10

Toolbar PageRank 0/10

$$PR(A) = (1-d) + d\,(PR(T1)/C(T1) + \ldots + PR(Tn)/C(Tn))$$

A

Vampire

My Favourite Vampire Stories

- Dracula - Bram Stoker.
- Carpe Jugulum - Terry Pratchett.

Notable for its non-shapeshifting vampire flight, as documented the here [1:E].
Of course, there are numerous other websites devoted to vampires [2:E].
There are also quite a few people who take seriously such myths as the flying pig [3:E]!
Other vampire sites Real Life Vampires [4:B]; Spotter's Guide [5:E].
Other mythology sites: Hairy Mythology [6:J]

B

Vampire

Real Life Myths

We start by mentioning the other websites that have joined us in our crusade to cut through the mishmash of mythology has obscured the eyes of humanity for aeons. One excellent example is here [1:I].

Vampire

The myth of the blood drinking vampire (as espoused here [2:A]) is based in part on the very real vampire bat of Central and South America. The growth into legend was probably fuelled by hallucinations [3:I], as well as being an effective means of child control [4:I].

Flying Pigs

The myth of the flying pig is a curious one, and would seem to be nothing more than a nonsense piece of doggerel, or perhaps the result of ingesting certain substances [5:I]. However, it has a basis in fact, the defining moment occurring in 1800, as the vessel HMS Cantaloupe was sailing past a small island in the Pacific ocean, laden with a cargo of wheat, cows and the rare Polynesian Hibernating Pig. The captain, Commander Jake 'Kaboom' Moran, decided to conduct a gunnery drill.

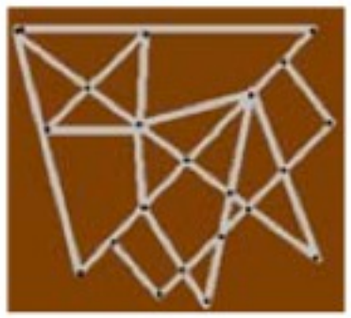
Unbeknownst to the brave captain was that one of the pigs had escaped, and had found its way to the gun deck. Seeing in the open muzzles of the cannon a memory of its home burrow, it picked one, struggled in, and drifted off to sleep. Now, this would not have been a problem, if the Commander was not regularly in the grip of paranoid delusion (a common ingredient. [6:I] in the genesis of legends) and as such, had decreed that the guns were to be loaded at all times. This meant that the happily snoozing pig was in fact just centimeters away from one sack of gunpowder and one very heavy cannon ball.

Vampire

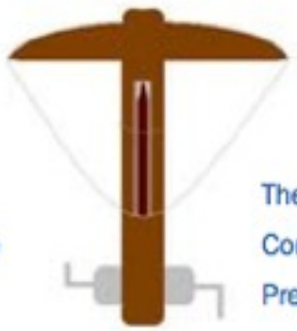
Vampire Slayers

Welcome to Harker's Sales, the one-stop equipment shop for every aspiring slayer. After purchasing your equipment below, you will be ready to slay the most demented of vampires. Take a look at this informative page [1:E] to see what your primary target looks like. Of course, as an aspiring hunter, you should be ready and willing to practice your craft on any passing myth, such as the flying pig [2:E]. Contrary to Hollywood myth, the basic vampire is a creature of cunning, employing many devices [3:D] to outwit you, from armoured vests [4:D] to the humble bottle of sunscreen [5:D]. Reading the basics from a vampire oriented page [6:D] is good preparation for your career in legend-dispatching.

Equipment



The 'Twister'
customisable all-purpose
religious symbol.



The 'Kebab' crossbow.
Comes with 10 Free
Pre-sharpened oak stakes!

D

Vampire

Do-It-Yourself Vampire

Welcome to Count Alucard's Do-It-Yourself vampire page! This page contains all the information you will need to make a successful life as a bloodsucker.

Etiquette

It is traditional [1:A] that vampires are extremely polite, even to their prey. Of course, there are (well documented [2:A]) times when this rule has to be broken in order to survive. It is much classier, however, to thwart suspicion with vast arrays of facts, such as those found here [3:B]. Of course, one should be extremely careful not to let slip too much information about vampires, but mistakes can happen. At such times, reference to some popular vampire stories [4:A] can explain your knowledge. When stalking your prey, it is useful to be able to anticipate their actions. Some insight into their psyche can be gained from examining the legends they believe in, such as ourselves [5:B], as well as what they have forgotten. The disappearance of the legend of the flying pig [6:B] is useful when you yourself need to slip from the mind.

F

Werewolf

PHB

Peter Hallory Blasted was tried and convicted of spawning numerous WerePayraises. He was sentenced to five slaps on the wrist. A cult has grown up around the notion that he was pushed out of his office window and descended to Earth on a golden parachute, but if that were true, it would no doubt be listed here [1:E]. But it isn't. So he didn't.

WAR

Wesley Andrew Raymond was tried and convicted of the fatal mauling of Truth. This was his first and only killing, but he was sentenced to perpetual reincarnation. More information [2:J]. On every one of his numerous deathbeds, a flying pig [3:E] has appeared briefly in the sky.

YHBT

Yvonne Hayley Basing-Tripp was tried and convicted of multiple fatal maulings of conversations. She was tangled in a never-ending thread and choked to death. More information [4:J]. As these trials show, mythical creatures can be a severe source of trouble. A handy guide to spotting them before they get too close can be found here [5:E].
More information on werewolf mythology can be found here [6:J].

G

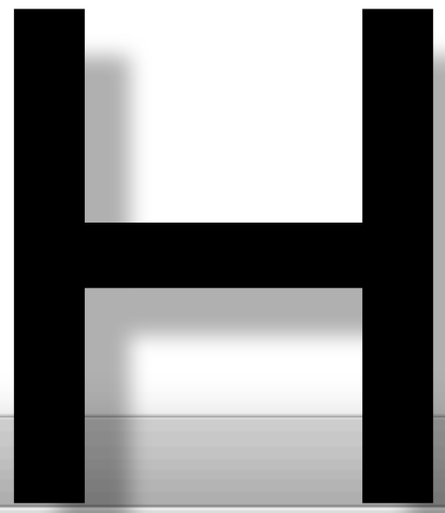
Werewolf

Hi! I'm an aspiring artist, and here are some of my drawings on my favourite theme: werebeasts! Werebeasts are many and varied, and include the rare WerePayraise [1:H]. and the not so rare WereFact [2:H].

Throughout history, many people have been pilloried as werebeasts, like Wesley Andrew Raymond [3:F]. One of the lucky ones was Peter Hallory Blasted [4:F], who escaped severe penalty and was able to continue his activities unpunished. Some sad, lonely people may not find this site the unparalleled haven of artistic wonderment that it is. They might find solace here [5:A]. In fact, everyone who doesn't want to give me money should go here [6:A] and stop wasting my precious bandwidth.

The eyeball of doom

Uber in Blue



Werewolf

Were?

Several people have been tried and convicted of various shapeshifting incidents. Among the most famous of these are Wesley Andrew Raymond [1:J] who was convicted of infecting Truth with WereFacts [3:F], and Yvonne Hayley Basing-Tripp [2:J] who was found guilty of mauling a conversation [4:F] to death. Of course, perhaps the most famous of all the undead is the Vampire [6:A].

•**WerePayraise**: Turns into a pat onto the back after one full moon has passed. Once spawned by Peter Hallory Blasted [5:F].

•**Werefact**: A fact that subtly shifts it shape into a lie while unwatched.

•**Wereship**: The most famous example is the Marie Celeste. Unknown triggers cause them to voraciously consume all life aboard them, and then resume their slow drift. There can be many hundreds of years between shapeshifts.

•**Werehosepipe**: On an almost weekly basis, these leave their dormant form and congregate in writhing masses of green plastic, a mating ritual almost as old as humanity. When they return to their home, they are so twitchy from the numerous cars they've had to dodge that they twitch themselves into a horrendous tangle before returning to dormancy.

•**Werehouse**: Often found in remote, swampy areas, they grow webbed feet and wander around for a few hours, before returning whence they came. No-one knows why. No-one cares.

Werewolf

WereSolves

Werewolves are just one instance of a general myth: that of a shapeshifter whose metamorphosis is triggered by some event. Other creatures similarly afflicted include werefacts [1:H], werepayraises [2:H], werehouses [3:H], wereships [4:H] and werehosepipes [5:H].

Some theories about their origins are: Hallucinogenics unwittingly ingested - for example, fungus in rye bread. Knocks to the head, inducing fits and hallucinations. A good story to scare the kids with, to get them in before dark. Psychological disorders, such as paranoia. It’s amazing what a variety of beliefs [6:H] can grow out of such humble roots.

Google

Vampire

Advanced search
Language tools

Google Search | I'm Feeling Lucky

New! Voice Search. Just click the mic and say your search.

E

Vampire

AIRBORN CREATURES OF MYTH AND LEGEND - A SPOTTER'S GUIDE

VAMPIRE

THE VAMPIRE IS A HUMANOID. SOMETIMES THEY SHAPESHIFT TO A BAT WHEN FLYING, BUT THAT IS NOT NECESSARY, AND THE MORE MODERN ONES DISDAIN IT. FOR MORE INFORMATION ON THESE CREATURES, SEE THIS PAGE [1:A].

FLYING PIG

OFTEN INVOKED, THIS RARE SPECIES COULD CAUSE A LOT OF CHAOS IF IT EVER LEFT ITS WELL HIDDEN HIDING PLACE.

RUMOUR

NEVER SEEN, SELDOM HEARD, AND VISIBLE ONLY BY ITS EFFECTS, RUMOUR HAS BEEN RESPONSIBLE FOR A LOT OF HUMAN CATASTROPHES THROUGHOUT THE AGES.

SEVERAL MYTHICAL CREATURES CAN'T FLY, BUT ARE STILL FASCINATING TO READ ABOUT. THEY INCLUDE WEREFACTS [2:J], A STRANGE SPECIES MOST CLOSELY ASSOCIATED WITH WESLEY ANDREW RAYMOND [3:J]. A WELL KNOWN CLASS OF MYTHI- CAL CREATURES ARE SHAPESHIFTERS [4:J], WHICH CAN TAKE ON EVEN THE MOST UNUSUAL FORMS [5:J], SUCH AS THAT ASSUMED BY YVONNE HAYLEY BASING-TRIPP [6:J].

Werewolf

Advanced search
Language tools

Google Search | I'm Feeling Lucky

New! Voice Search. Just click the mic and say your search.

Werewolf

This page is a list of famous myths of werewolves. Unlike some other myths [1:E], the werewolves documented here are historical figures - no flying pigs [2:E] to be found here! Of course, mythology can be taken a bit too far [3:D].

Wesley Andrew Raymond

Wesley Andrew Raymond started out young. He was barely five years old when he made his first sweep- ing generalisation. By the time he was seven, he had progress to fibs, and age twelve saw him switch to outright lies. Spotted as a potential star by the Ministry of Truth, he was recruited at fifteen years old, and sent to the Academy Demagogue, where he placed first in his class, earning an award for his taming of rumour [4:E]. Rising quickly through the ranks, he finally succeeded in convincing the populace that black was indeed white, a fact confirmed by the Great Colour Ballot. War broke out in the next year, and country was overrun. Wesley was sentenced to exile, but unfortunately for him, he decided to appeal. The appeal was scheduled for the night of the full moon, and Wesley couldn't control himself - shapeshifting into a small leaflet, he flung himself viciously at a handy victim. He was convicted of spawning werefacts, and sentenced to perpetual reincarnation.

Yvonne Hayley Basing-Tripp

Several promising discussions on such varied topics as Linux vs Windows, religion, gun control and the habitat of the flying pig [5:E] were tragically cut short in the prime of their lives, their savaged corpses alone except for faint smears of bile and traces of rumour [6:E]. Eventually, a young woman named Yvonne Hayley Basing-Tripp was arrested. It was alleged that, every full moon, the demure university student shapeshifted into a rampaging wolf, sometimes killing as many as ten innocent conversations in a single night. She was tried, convicted and killed for these murders. However, rumour has spread of new conversations suddenly disappearing...

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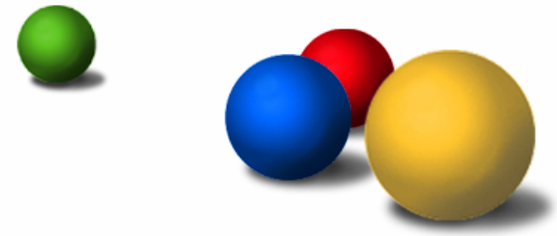
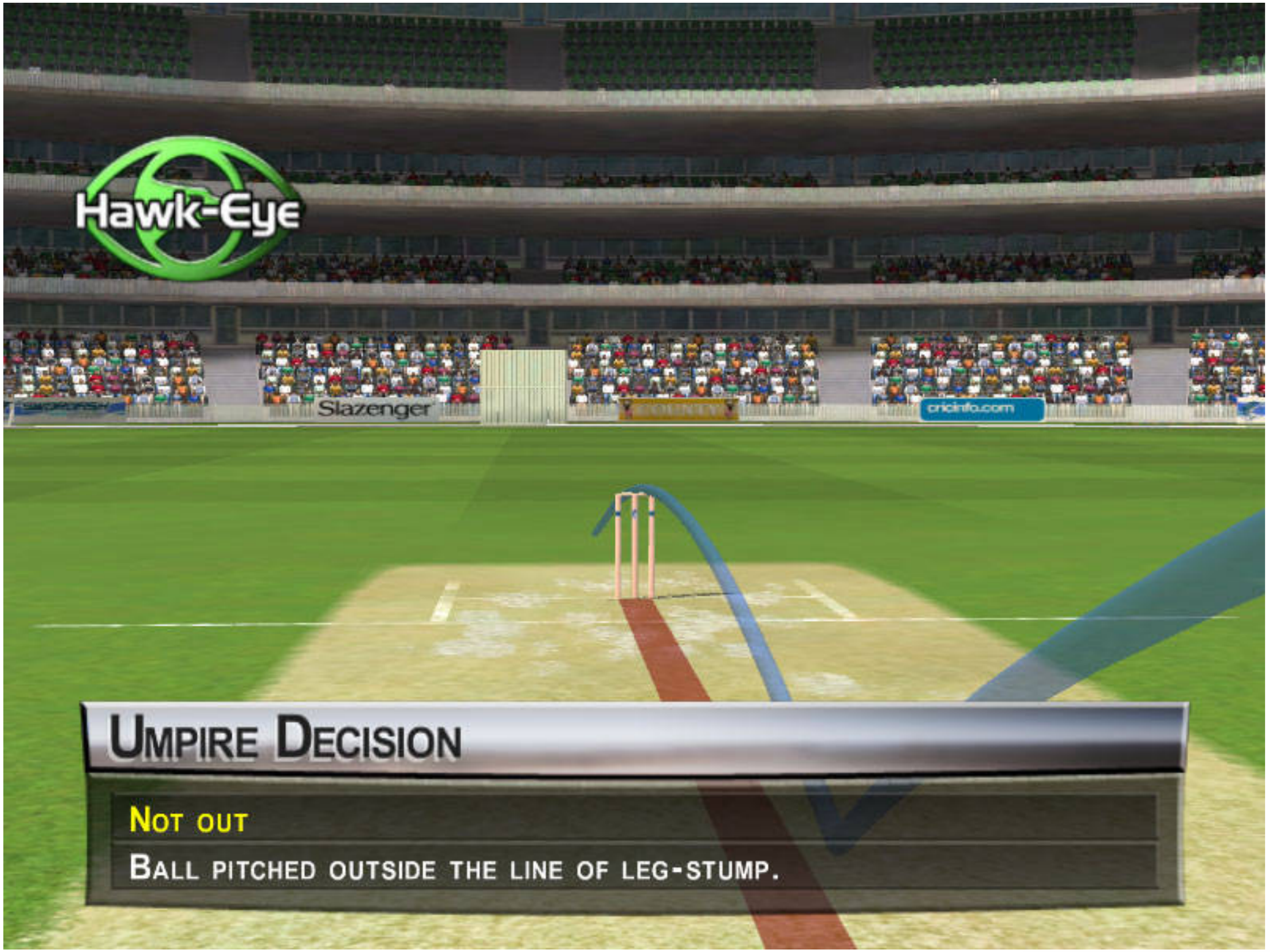
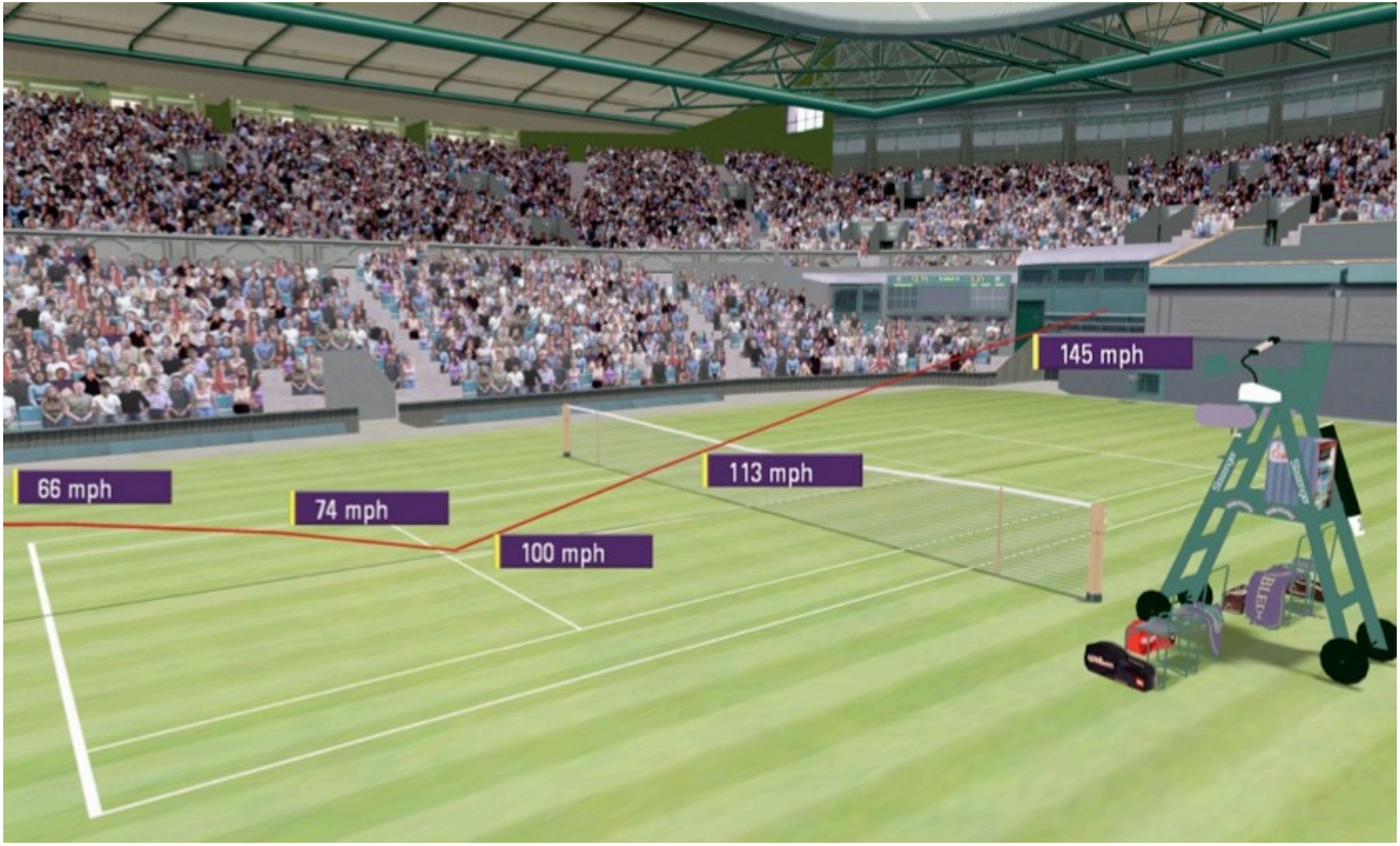
- Pseudo-random numbers
- Probability
- Binary arithmetic
- Logic gates
- Encoding text
- Optical transmission
- Polarization
- Quantum computing
- The Internet
- WWW
- HTML
- Graphs
- Linear algebra
- Random algorithms

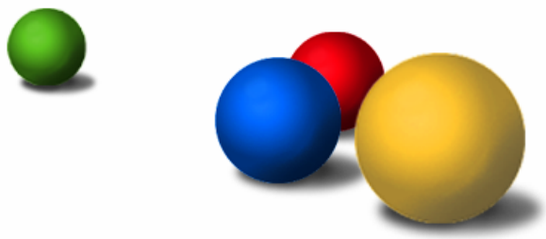
Search Factoids

- Page Rank is one of 200+ signals.
- More than 1B searches per day.
- More than 100 million Gb indexed.
- Average response less than 250ms.
- 1000 person-years of development.
- 6000 quality experiments resulted in 500 changes in 2010.
- Blogs and news content updated instantly.
- YouTube gets 35 hours of video uploaded per minute.




Hawk-Eye
Slazenger
cricinfo.com
UMPIRE DECISION
NOT OUT
BALL PITCHED OUTSIDE THE LINE OF LEG-STUMP.


66 mph
74 mph
100 mph
113 mph
145 mph



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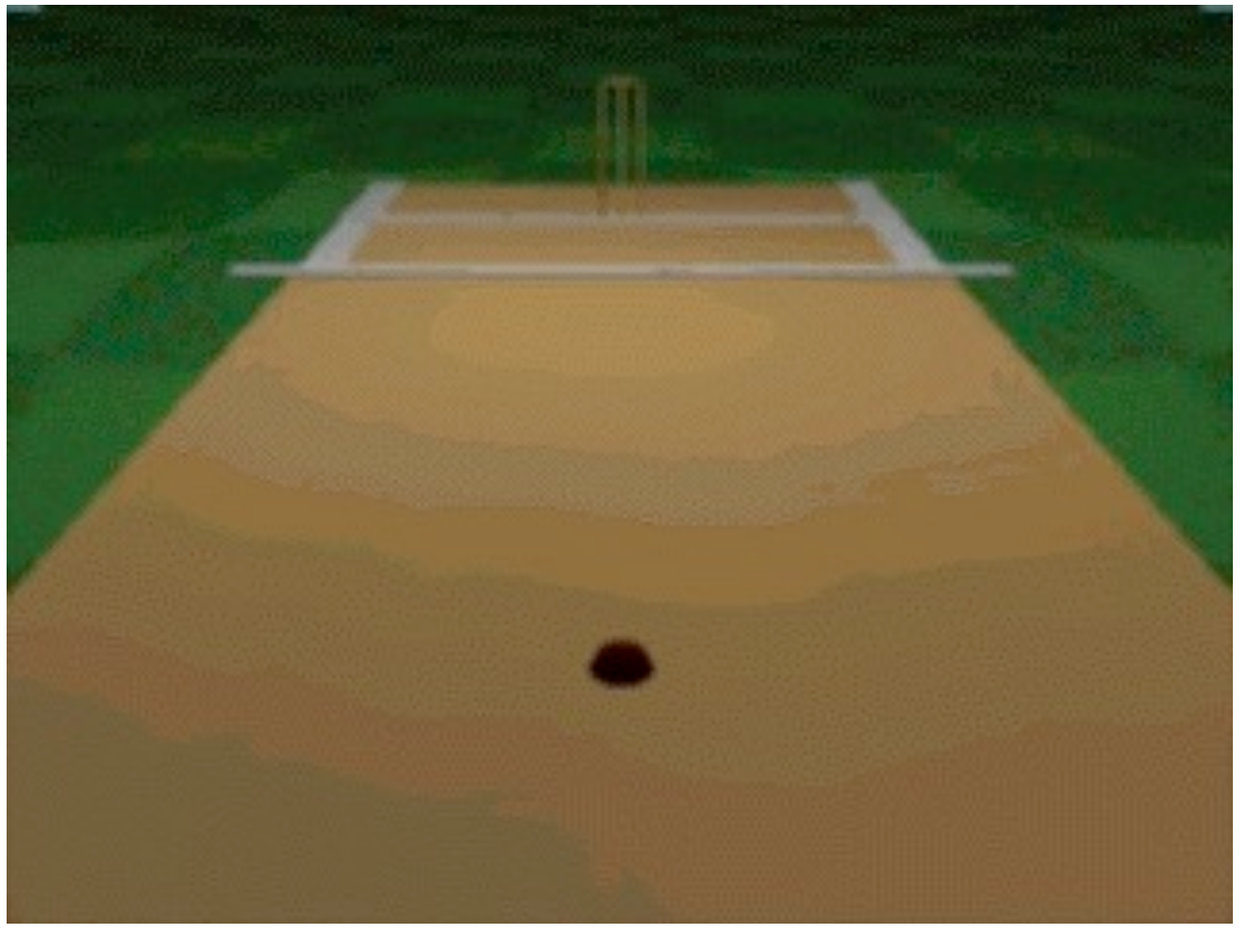
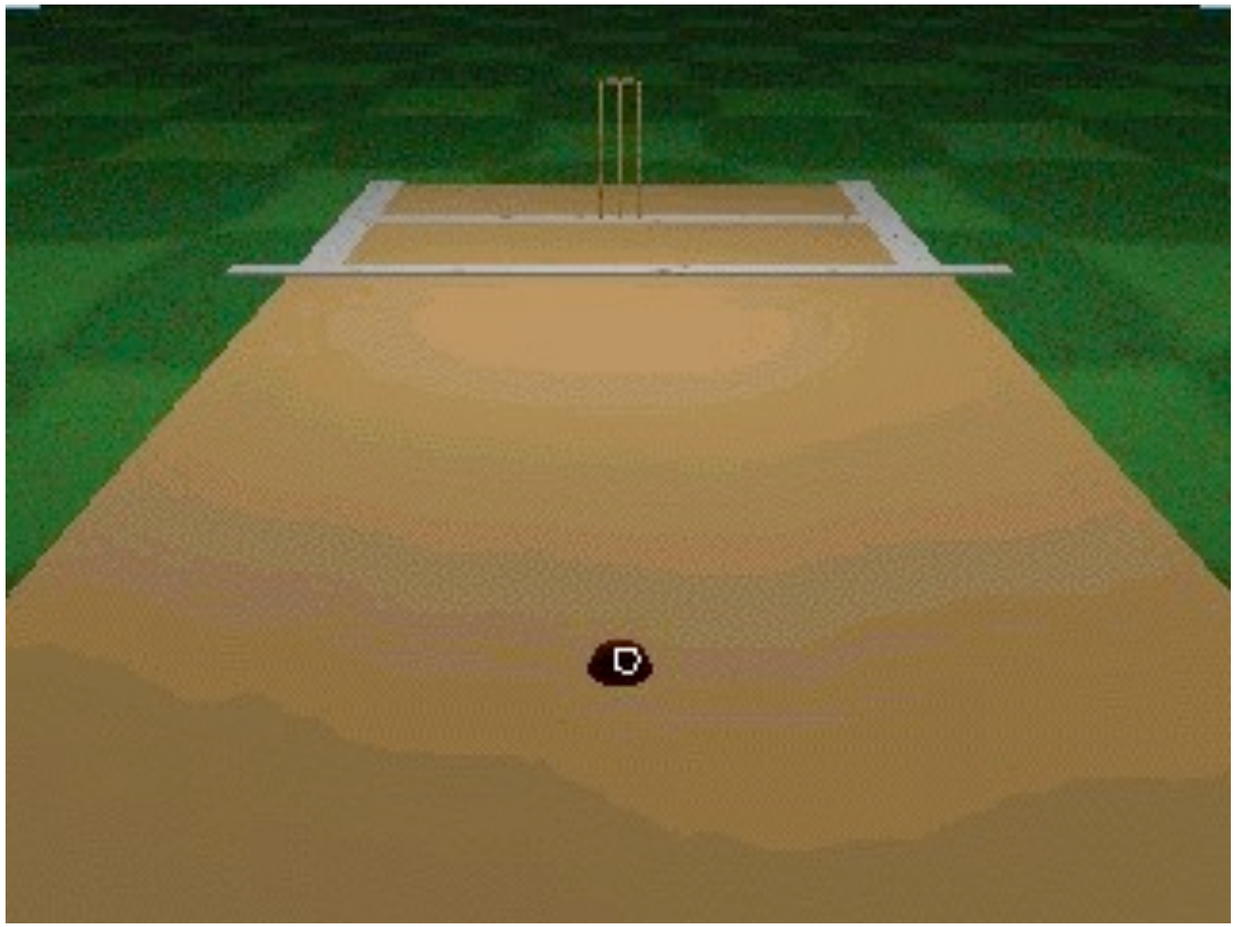
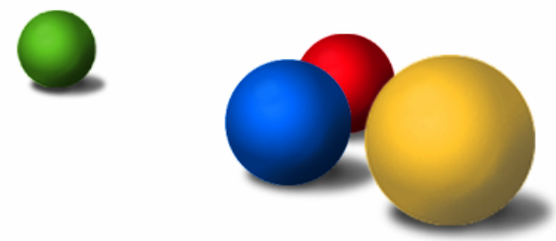
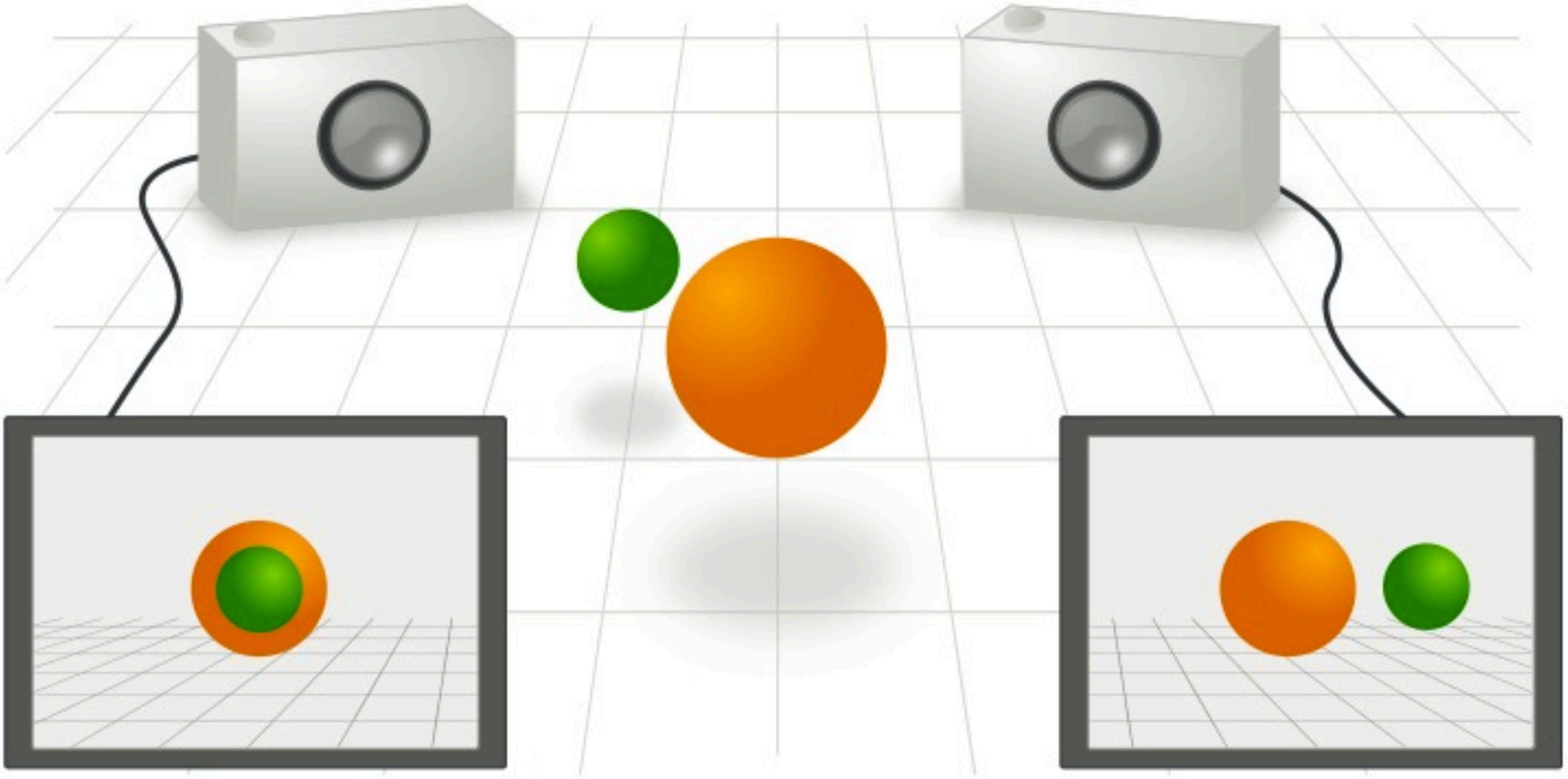
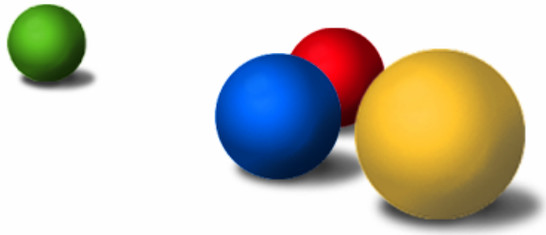


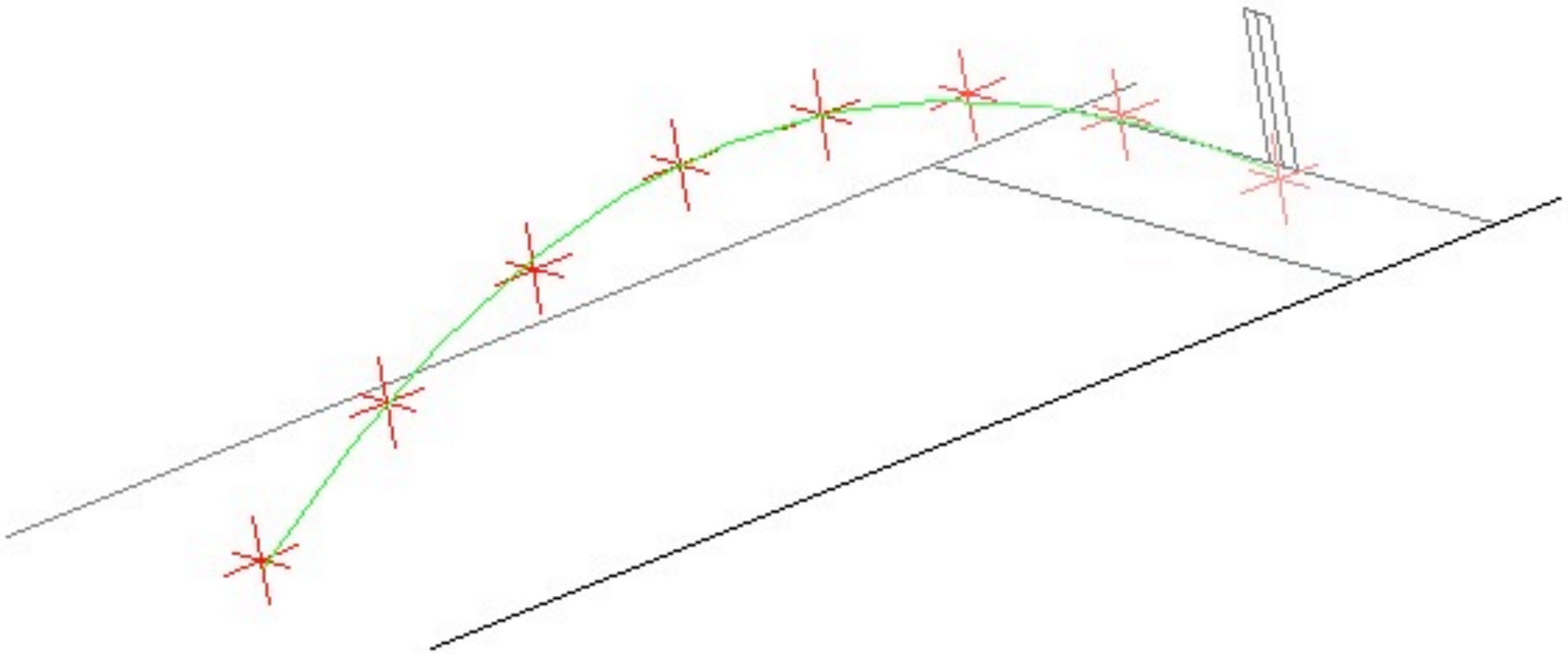








Pitch



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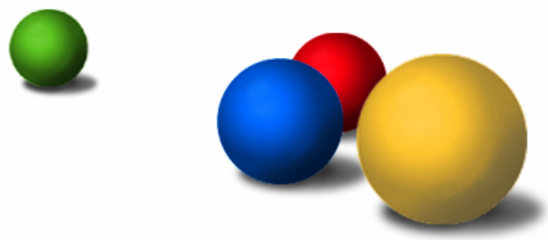
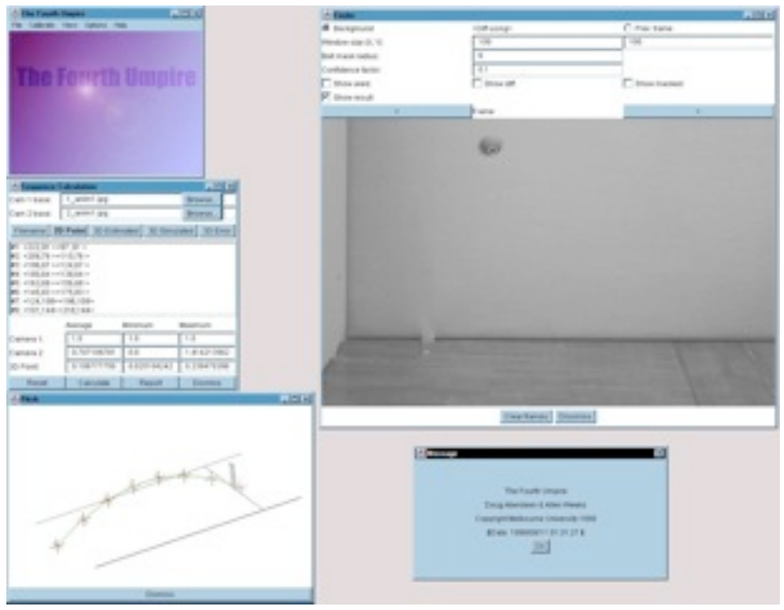
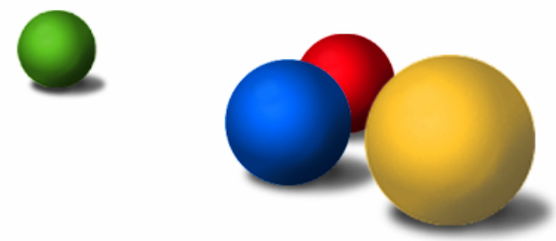




- Codes
- Circuits
- Combinatorics
- Search spaces
- Base 2
- Information theory
- Pseudo-random numbers
- Probability
- Binary arithmetic
- Logic gates
- Encoding text
- Optical transmission
- Polarization
- Quantum computing
- The Internet
- WWW
- HTML
- Graphs
- Linear algebra
- Random algorithms
- Image processing
- Stereo Vision
- 3D graphics
- Quadratic equations

- Sinclair ZX Spectrum.
- Games (John Carmack & Will Wright)
- The first coders (Euclid, & Ada Lovelace).
- Robotics (Karel Čapek, Isaac Asimov, Football).
- Synthesized music (Robert Moog).

- Allan Turing, the Award and the Test.
- Colossus & ENIAC.
- Self-driving cars (Sebastian Thrun).
- AI: Backgammon to Watson (Gary Tesauro).

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