Some Issues in the Creation of Music Online.*

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This paper explores both web and non-web approaches to internet music-making. It puts forward the idea that internet communities can make internet music. It imagines a spiral rhizome, or infinite sound lattice, and analyzes a test case: Symphony for Cornwall (1999). It compares the various forms of musical experience and explores the nature of mediated experience, online identity, internet relationships and internet sound. It also examines MUDs, MOOs, MUSHes and other forms of synchronous or asynchronous online interaction, and suggests some possible models for future internet composition.

Keywords: messageboard, forum, newsgroup, IRC, flamewar, troll, spam, emoticon, MUD, MOO, MUSH, avatar, rhizome

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Tuesday, May 01, 2001
Web and Non-Web.

Music on the web these days usually takes the form of a user 'visiting' a site. There are numerous types of site involving music or sound: resources; information and support; education; composition; commercial; broadcasting; audio handling; wired spaces and performers; e-operas, e-symphonies and e-instruments; and many more. The user's experience at these sites is generally fairly passive, mainly focusing upon listening or some kind of shopping. Some more interactive sites have started to appear over recent years, often with a strong game-playing feel, but these are still relatively rare. However it is possible to remix at Shockwave (http://www.shockwave.com) or record in the virtual studios of the Rocket Network, (http://rocketnetwork.com) or do some online jamming at Jsyn (http://www.softsynth.com/jsyn), or explore and create electronic sound at Electronic Music Interactive, (http://nmc.uoregon.edu/emi/emi.html), and there are many other significant examples of web musical interaction.

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* This paper was written as a blog (visit http://www.blogger.com to create your own blog). It is designed to be read post by post, but in a random order. The posts are as follows:
Web and Non-Web.
Internet communities make internet music.
A spiral rhizome, or an infinite sound lattice.
A test case: Symphony for Cornwall (1999).
The various forms of musical experience compared.
John Cleese and René Magritte.
The strange case of Tsukasa Tani.
True internet confessions.
Glossary. (This offers definitions and commentaries upon the following jargon terms used in the article: 1. Messageboards and BBS, 2. Forums and newsgroups, 3. IRC, 4. Flamewars, 5. Trolls, 6. Spam, 7. Emoticons and acronyms, 8. MUDs, MOOs and MUSHes, 9. Avatar, 10. Rhizome, 11. Distributed networks and packet-switching).
I must thank Dr Simon Atkinson for several helpful conversations during the writing of this paper.

Although some of these sites do allow for some limited textual interaction between users, the emphasis on the web tends to be put upon the auditory experience. One of the great things about music, however, is that it is a social activity as well as a sonic experience. The internet has many non-web modes, which might provide a more productive model for future making music. Although these may be hosted on the web, they embody the traditional internet values of discussion and community. Usenet newsgroups, e-lists and forums, message-boards, Internet Relay Chat (IRC) all provide means of social interaction which are peculiar to the net. More self-consciously creative are Multi-User Domains (MUDs) and Object-Orientated Multi-User Domains (MOOs). These originated in role-playing games and so far little has been done with them musically, although the Rocket Network's 'resrocketsurfer' project has made a preliminary attempt.

A hybrid version of these, called a Multi-User Shared Hallucination or MUSH, provides perhaps the best analogy for how netmusic might be. In a MUSH, certain characteristics or principles within the virtual world are accepted in advance by the users. This gives an opportunity to build upon shared previous understanding in a way that might be useful for music-making. The avatars would presumably be sound-forms or sound-objects, and the virtual environment some kind of reverberant space (the MUSH programme could include a simple reverb application). Interaction between sound-forms would follow user-defined laws in much the same way that the Tolkien-esque characters in a typical MUD behave according to pre-defined attributes.

The netmusic made in this MusiMUSH would be shared by all the participants and therefore inherently social. However, taking into account the current technical limitations of the internet, MusiMUSH play would presumably require an acceptance that:
a. something is missing from the sounds themselves;
b. the listener's monitoring setup is likely to be variable at best;
c. an originator has no real control over the way a listener experiences the music;
d. the structure of the music cannot be fixed.
[Posted by Andrew Hugill at 11:20 AM]

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Friday, April 27, 2001
Internet communities make internet music.

Internet communities do not necessarily share geographical location, or cultural inheritance, but rather *a common interest*. The analogy with folk music is perhaps awkward, but the ethnography of the net is defined by ideas and interests rather than race or geography. So, one might have a group of Chinese traditional music enthusiasts, none of whom is Chinese. Indeed, the word 'Chinese' starts to lose its meaning, because the internet conception of China is different to the 3D conception. And what is 'Chinese traditional music' online? Just a shared enthusiasm of this group of people, or their avatars.

People's motives online are generally a mixture of greed and curiosity. If they can get something out of a particular site or group, then they will return. Likewise, if the site has a peculiar or intriguing feature, they will return. Thus communities form. This is real, and the net is real, although cyberspace perhaps still has a way to go before its rewards match those of the sensual world. Probably the best evidence for this alternative reality is provided by some of the classic problems that arise in internet communities, such as flamewars, trolls and spam. For those who have been involved in internet discussion, the intensity of experience these represent has the power completely to subsume all other thought and activity.

An experiment in threaded 'sound-discussion' is currently taking place at the Sintesi del Suono project (http://www.publinet.it/FreeWeb/sintesidelsuono). This takes an organic model, with users posting 'seed' sounds which are then resynthesized and shared by members of the group. The process of evolution is interesting to follow, although the sounding outcomes are as yet fairly limited in scope. Any such experiments are hampered by the familiar current technical problems of the internet: long downloads; format issues; compression; and so on.
[Posted by Andrew Hugill at 2:50 PM]

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Wednesday, April 04, 2001
A spiral rhizome, or an infinite sound lattice.

Onscreen a graphical representation of a distributed network. Each node is a piece of recordable cyberspace, rendered as a spiral. Users can record anything into these spirals, using the built-in microphones on their machines, or by uploading soundfiles (drag and drop). There is a toolbar, which enables various functions, ranging from 'random play', which wanders along the lattice in a continuous sequence, to 'select play', where the user draws a box around a group of nodes and has them play simultaneously or in a selected order.

What is being created here is a massive database of sounds, which can be searched according to tagged criteria input with the sounds. A user could call up all his/her own sounds, or all those created in New Zealand, or whatever. Perhaps a spectromorphological categorisation could also exist, in which sounds are grouped according to spectrum; pitch; rhythmic content; or any other parameter. A composer might then plunder the lattice for more or less related sounds.

When the user logs on, a click can take them to their last entry, or some free space, or they can configure the database. The interface must be as intuitive as possible, so the programming implementation of this idea is challenging, involving perl scripts, java (presumably), databases, and so on.

The structure of knowledge online is rhizomatic, or non-hierarchical. Whereas a library represents a hierarchical system, since experts have already travelled along all its shelves classifying the information, the internet is not so classified. The search for information and data retrieval does not suggest a superhighway so much as a sea full of fish and flotsam.

Can one transcend the rhizome (asks Simon)? I believe we will one day find a way, but the currently familiar solution of creating ever-grander and more over-designed websites seems to invite a law of diminishing returns. For now, I feel like the two-dimensional inhabitant of Edwin Abbott's classic text 'Flatland' (1888), who can only infer 'Spaceland' and looks forward to the day when he can eventually get there.
[Posted by Andrew Hugill at 8:29 AM]

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Sunday, April 1st, 2001
A test case: *Symphony for Cornwall* (1999)

This project was commissioned by the Arts Council's 'New Audiences' scheme. Secondary schools across Cornwall were invited to send me short (10-15 second) sound recordings of anything they chose. I then used these as the 'seeds' from which to grow a composition for orchestra and live electronics. The working process was charted, discussed and developed on the website (http://www.symphony.cornwall.dmu.ac.uk).

Another important outcome was a performance at the Hall for Cornwall, Truro on May 27th 1999, given by the Bournemouth Sinfonietta plus live electronics (conducted by Richard Studt). This event was attended by a large audience of mostly young people, many of whom had not been to a concert before, and for whom the premiere was an opportunity to hear a work in which they had a personal involvement and at least partially understood.

The incentive for the participants in this project was both educational, technological and musical. The use of the internet as a compositional medium led to a small community of individuals forming around the discussion room and message board on the website. This included not just participating schools, but also members of the orchestra and other interested parties. For the latter, this was an opportunity to witness the use of music technology in composition and performance. For the former, the project was a significant part of their year's work, and prompted debates both about the nature and purpose of music and, on a more practical level, about the way in which this particular piece of music was unfolding. The internet activities were supplemented by workshops, and I made visits to the schools as well as leading studio work with the orchestra.

It is important to stress that Symphony for Cornwall was an education project, just as much as a technological or compositional project. My role was to lead the project, and to a great extent to be the educator, both of the participants and the teachers. A consequence of this was that the creative process was laid open, and the contributors had the opportunity to interact with and to some extent to influence it and its outcome. The project therefore had a collaborative flavour, without being a full collaboration in the sense of equally active and autonomous creative forces engaged on a collective endeavour. Perhaps the best model for the process was a moderated internet newsgroup, where one individual to some extent directs and initiates the discussion, but the subscribers are actively involved in the discussion itself.

The project's title was important (over and above its obvious nod to Hall for Cornwall, the venue for the premiere) because it affirmed that this was not a picture-postcard 'Cornish' Symphony. The Cornish element in the piece was supplied by the simple fact that the contributors of the sound recordings lived in Cornwall. As it turned out, the sound-files included one folksong and seaside-like contributions (such as Poltair School's harbour soundscape) although these could have come from any coastal region. The majority of sound-files were incapable of association with any particular location or idea. This did not prevent one member of the audience posting a message the day after the premiere which sighed "how Cornish it was"!

Schools were provided with digital recording equipment, and the instructions stated that absolutely any sound, be it musical (in their view) or otherwise, could be used. Some contributors took the opportunity offered by this open brief and supplied quite challenging material, sending in (via the internet or through the postal system on minidisk) an assortment of noises, sounds and effects. Several other contributors decided to make short pieces or tunes, sometimes using MIDI. The children had no problem with the concept of the piece, and using the internet as an interactive tool came naturally to them. It came less naturally to the older generation, including some of their teachers, for whom the project was an opportunity to expand horizons.

Whenever I edited or worked on the sound-files, I gave an account of the various techniques used and posted audio and visual examples in the "Electronic Workshop" area of the website, enabling people to listen to and discuss the results. However, throughout the project there was discussion about audio compression formats and real-time audio streaming via the web. Download times were a persistent problem (mp3 was still relatively new) and this is something we all hoped will be remedied as web technology improves.

Although the prospects of the music itself ever being performed again seem fairly slim, 'Symphony for Cornwall' lives on in the website and its messageboard and discussion room, which are still active. The community that surrounded the piece, and the idea of the piece, are as much the piece as the sounds made on May 27th 1999. For myself, it has meant the creation of more generic protocols for internet composition, including a piece modelled on packet-switching which will offer the participants a more equal role in the compositional process.

[Posted by Andrew Hugill at 11:20 AM]

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Friday, March 22nd, 2001

The various forms of musical experience compared.

Live acoustic music-making: synchronous, limited access, social, physical
TV/Radio: Potentially asynchronous, controlled access, asocial, aphysical
Postal exchange: asynchronous, person-to-person, aphysical
CD/software: asynchronous, limited access, asocial, aphysical
Internet: asynchronous, accessible, social, aphysical

Internet technology is about compression, and the act of compression already removes something from sound. In the case of mp3, this is high end, low end and dynamically masked material, not to mention the sampling rate. In addition, the nature of most home computer monitor setups leaves a lot to be desired.

From an electroacoustic perspective, therefore, the internet presents a vastly unappealing prospect: uncontrollable listening, degraded sound quality, and materials which signify by reference rather than by content. The sampling culture tends to suggest that the internet points to what is missing from its sounds.

On the other hand, the net is a communications technology and offers possibilities that perhaps do not exist elsewhere in electroacoustic music. For example, acoustic ecology presents opportunities to hear places, which may be an interesting area of development online. I already feel I know Vancouver well, for example, without ever having visited the city. I have become an acoustic tourist. Acoustic ecology also presents us with models for human communication which might be relevant on the internet as well as in 3D. These models, especially those which filter 'noise', can perhaps be translated into an internet listening strategy, in which digital music becomes a kind of folk music.

[Posted by Andrew Hugill at 2:43 PM]

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Monday, March 19, 2001

The strange case of Tsukasa Tani.

Tsukasa Tani is a third year student of Music Technology on my Internet module. Being Japanese, he decided to do some work for a web project using Japanese electronic music. Part of this music involved plunderphonics - taking material from the work of others. Being a conscientious student, he sought copyright clearance for this. The band whose work he wanted to use gave permission. But the Copyright Protection Society were a good deal more confused about the issue. Eventually, I had to write them a formal letter, at which point they too gave permission.

This led to a general discussion about intellectual property and protection of identity. Now, Tsukasa's spoken English is not so hot, so to illustrate the point I was making about identities I said: "you want to be an internet artist, and to do so you are going to have to create an identity online or decide to remain anonymous". He looked blank. I said "o.k., for all I know, you already have a presence online, let's see" and I entered his name into Metacrawler.

Up came a link to mp3.com. Detecting a burgeoning presence I said, "o.k. Tsukasa, I see you are already an internet artist". He smiled, but I don't think he was quite following. Anyway, I clicked the link, and was taken to some fairly bland, ambient-meets-Goth-rock music, made by... Tsukasa Tani. "I didn't know you were into this sort of thing".

Light began to dawn on Tsukasa's face. "That's not me!" he said, and became increasingly horrified. I clicked on the 'further details' link. 'Tsukasa', it turns out, are two Welsh lads named Dave and Chris, and they make this music in their kitchen. Amusingly they are very reticent about their real identities, which allowed me to tease Tsukasa a little about how this might be a hoax perpetrated on me by him. He protested his innocence.

'Tsukasa', it turns out, means 'a little hill' and 'Tani' means 'dictionary'. Why they chose that name is unclear, perhaps they looked up the Japanese for 'hill', since they live in Wales... who knows? I asked if Tsukasa wanted to email them and introduce himself as the real Tsukasa Tani, but he did not. His identity crisis was complete. At best, he could only be an avatar of himself, a virtual projection. And to the net community, he might as well be two blokes in a Welsh kitchen as a Japanese plunderphonicist.

[Posted by Andrew Hugill at 5:31 PM]

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Thursday, March 08, 2001
The internet in society.

The internet is held responsible for every evil under the sun. The poor baby girls from America, bartered and exchanged online by a succession of irresponsible people. Instructions on how to make bombs. Paedophile rings. Hackers. Suicide online! (This last exists in an ever diminishing newsgroup, alt.suicide). A tidal wave of porn. Fascism. And, worst of all, sad, lonely people who need to GET A LIFE!!! As a vision of hell, or at least Sodom and Gomorrah, it cannot be bettered. And you can't touch it!

It's unregulated, leaderless, has no government and recognises no national boundaries. Instead the world is divided into two - those online (the affluent minority) and those offline (the poor majority). From a political point of view, this is the most terrifying and threatening configuration possible. No wonder government and the body politic strive hard to manage the internet. Industry, commerce and ordinary decent people through their subscriptions to highly structured ISPs, attempt to filter out unwanted traffic and replace it with useful, healthy and recognisable materials.

How much this resembles real life! No, let's not call it "real life". Let's call it: 3D life, life offline. Life before the internet. 100 years before the internet there were paedophile rings. There was a tidal wave of porn. People made bombs and committed suicide. Children were bartered. The world was divided into haves and have-nots. We fought big bloody wars to make sure it stayed that way. The internet is a tool and we can do with it as we please. It is *people* who do things we do not like. Internet life is real, as real as my dreams seem to me to be as I dream them.

Music is made by people and for people. It is shared, and discussed, and social. For music on the internet to exist, a suitable social structure must also exist. This is still in its infancy, rather like the role one imagines for music in neolithic culture. So much internet sound is just communication signal: hello! goodbye! alert! The sophistication of 3D society can be a hindrance online, where we must learn to share and interact all over again.
[Posted by Andrew Hugill at 10:21 AM]

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Thursday, March 08, 2001
John Cleese and René Magritte.

Flicking through the TV channels last night, I chanced upon the closing minutes of a documentary series about the human face, fronted by John Cleese. He was delivering a speech about how the important things in life are human beings, and his speech became gradually more and more of a rant. Being Cleese, I knew that this was exaggerated for effect, but also being Cleese, I knew that he was making a serious point nonetheless. As he reached a climax of Basil Fawlty-style rage, his female assistant threw a bucket of water over him. He stopped and gasped, pulled himself together, and said "there...you can't get that on the internet!" He then thanked his assistant with the words "I needed that", upon which she came over and kissed him. In a state of mock delight, he said "you can't get that on the internet either!" Finally, we cut to him on top of a skyscraper, holding a sledgehammer. With manic fury, again echoing Fawlty hitting his car with a branch, he smashed up some computers and delivered a "watch out the technology is taking over" speech.

I had a Magritte moment.

You may remember Magritte painted an exemplary picture of a pipe and wrote underneath "this is not a pipe". The point was, of course, that it was a *painting* of a pipe, not an actual pipe. The bucket of water and the kiss were similarly not actual buckets of water and kisses. They were on the television. And Cleese's rage and pleasure were no more "real" either. They were acted. His point remains that a computer cannot kiss you. But buried under such layers of artificial reality, mediated reality, fakery and buffoonery, one starts to question which reality it is that is being substituted for which.
[Posted by Andrew Hugill at 9:45 AM]

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Thursday, March 01, 2001
True internet confessions.

I should confess that I am an internet romantic. I met my wife-to-be, Louise, online several years ago, when connecting to the net was rather more of a technical challenge than it is today. I was living on an island at the time, St. George's Island, Looe, off the south Cornish coast, where I was composing a large piece called 'Island Symphony'. In fact, it's not strictly true to say I was composing the piece on the island. Owing to the eccentric electrical supply given out by the generator which was the island's sole source of power, I found myself obliged to spend significant amounts of time on the mainland where I had rented a flat overlooking the mouth of the Looe river. Here I could use the computer system which enabled the composition. 'Island Symphony' began life as an electroacoustic piece, but was 'translated' for orchestra four years later. So I worked in isolation on the mainland and made trips to the island for inspiration and the convivial company of the two sisters, Evelyn and Babs Atkins, whose hospitality enabled the whole project. The research work, therefore, expanded to include hauling tons of seaweed up from the beach to fertilise the garden, or shrimping, or chopping wood round the back of the stone cottage where I stayed. I was an islander for six months, and like any Robinson Crusoe, found myself collecting what the tide brought me and making signals to the outside world. The internet and the sea, the island and my computer, became intermingled in my mind in a way which was more than mere metaphor. At 1 a.m. each night, I would finish work on the Symphony and go online to mix with people. Louise, who was working as a chef, kept similar hours and so we talked. 'It's great to see your pixels again', I said, and I really meant it. My heart lept at the sight of a line of Times New Roman, just as readily as any lover's heart leaps at the sight of the beloved. When we finally met "in 3D", as net people say, we knew each other so well that the meeting and the future was a formality. Our relationship was no less real for being virtual. It was simply a different kind of reality, and one which we both embraced warmly.

[Posted by Andrew Hugill at 11:10 PM]

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Glossary
(compiled with some reference to *The Jargon Directory* (http://info.astrian.net/jargon) and Virginia Shea's *Book of Netiquette* (http://www.albion.com/netiquette/book).

1. Messageboards and BBS
A messageboard is like a conventional notice board, in that the user 'posts' a message to the board for everyone to read, but it differs inasmuch as other users may then post replies. This is an asynchronous activity. Once a reply has been posted, that discussion then becomes known as a 'thread', and most messageboard software allows posts to be grouped and viewed thread-by-thread. Messageboard interaction can be very prone to difficulty, since the speed of exchange resembles conversation and yet there is the likelihood that any post will be picked over in considerable detail. BBS (Bulletin Board System) is the same as a messageboard, but the term BBS has been steadily dying out over the past few years.

2. Forums and newsgroups
Forums are virtual places where users may congregate to read messageboards or engage in real-time interaction. Newsgroups consist only of messageboards. The most common type of newsgroup is to be found on Usenet, where roughly 35,000 groups cover all imaginable interests from all imaginable angles. In both cases, users are well advised to be aware of etiquette (or 'netiquette') and it is generally a good idea to 'lurk' in the group, reading posts and saying nothing, for a week or so before making your presence known. Many usenet groups are unmoderated, that is to say no one person is responsible for content, and consequently they can be dangerous and disturbing places to be.

3. IRC
Internet Relay Chat, or live online chat, is a synchronous activity. This is the fastest and most vertiginous form of internet interaction. You type your words into an onscreen box, then hit 'send' to inject them into the group conversation, which looks rather like an evolving onscreen playscript. It is possible to invite individuals to have private conversations alongside the main public conversation, and it is not uncommon

to have half a dozen boxes simultaneously open onscreen. Given the amount of typing and manual dexterity needed to do this, the language tends to be full of acronyms and emoticons, which make it hard for novices to follow.

4. Flamewars
Flamewars are most often caused by the brutal reality of text and its lack of inflection or tone of voice. Here's a classic pattern for a 'PC' flamewar:

• Person A makes a light comment, generally tangential to the main discussion.
• Person B interprets the comment in the worst possible light and fires off an outraged reply, in which A is called a racist, a fascist or whatever insult seems appropriate
• Persons C-L weigh in, supporting either party, with 'I agree!', 'Me too!' or 'Shame on you!' posts
• Person A replies saying, "Hey, it was just a joke. I'm not a fascist. Lighten up."
• Person B says, "This issue is DEADLY SERIOUS and I WON'T lighten up."
And so on, until the group dies or the members leave.

Flames can be classified by type, as follows:
1. Spelling/grammar (people correcting other people's spelling or grammar)
2. Bandwidth ("Do you realise how many people had to read your stupid message?")
3. Clueless Newbies (group virgins asking stupid questions are often flamed at will)
4. RTFM ("read the ******* manual", prompted by people who obviously have not read the FAQ (Frequently Asked Questions file), or newsgroup charter)
5. "My-Computer-is-better-than-your-computer" (Mac users beware!)
6. "Get-a-life" (a flame directed at an individual's real or perceived lack of existence outside the group)
7. Deliberately Offensive (just gratuitous insults or drivel)
8. Advertising (closely related to spam - most groups do not appreciate unwanted advertising)

An amusing usenet law, called Godwin's Law, states:
"As a Usenet discussion grows longer, the probability of a comparison involving Nazis or Hitler approaches one." There is a tradition in many groups that, once this occurs, that thread is over, and whoever mentioned the Nazis has automatically lost whatever argument was in progress. Godwin's Law thus practically guarantees the existence of an upper limit on thread length. However there is also a widely-recognized codicil that any intentional triggering of Godwin's Law in order to invoke its thread-ending effects will be unsuccessful.

5. Trolls
These are posts or posters who set out to attract predictable responses or flames. The word comes from a style of fishing in which one trails bait through a likely spot hoping for a bite. The well-constructed troll is a post that induces lots of newbies and flamers to make themselves look even more clueless than they already do, while subtly conveying to those in the know that it is in fact a deliberate troll. However, one often encounters an individual who chronically trolls by regularly posting specious arguments, flames or personal attacks to a newsgroup, discussion list, or in email for no other purpose than to annoy someone or disrupt a discussion.

A more sinister variant of trolling involves avatars (alternative online identities) trolling for real-life sexual encounters, including the oft-reported paedophile striking up a friendship with a young person while pretending to be of a similar age. A good newsgroup moderator should be able to detect this kind of troll, and the more shocking cases often take place in unmoderated or otherwise unregulated groups.

6. Spam
To cause a newsgroup to be flooded with irrelevant or inappropriate messages. You can spam a group with as little as one well- (or ill-) planned message. This is often done by cross-posting to more than one group. Advertising and chain-mail can also be classified as spam.

7. Emoticons and acronyms
The importance of these apparently childish typographical games in successful internet communication cannot be underestimated. In high-volume text-only communication forums such as Usenet, the lack of verbal and visual cues can otherwise cause what were intended to be humorous, sarcastic, or ironic comments to be badly misinterpreted, resulting in arguments and flame wars. They can make the difference between being understood and all-out warfare. Here is a comparative example, from IRC:

Me: Hi Jim, you've left your brain behind today I see.
Jim: Who the hell are you to call me stupid?

Me: Hi Jim, you've left your brain behind today I see :-)
Jim: <snigger> nope, I just borrowed yours ;-)

An emoticon is literally defined as "an ASCII glyph used to indicate an emotional state in email or news". Hundreds of emoticons have been proposed, but only a few are in common use. Look at these sideways-on to understand the symbology:

:-)
'smiley face' (for humour, laughter, friendliness, occasionally sarcasm)
:-(
'frowney face' (for sadness, anger, or upset)
;-)
'half-smiley' (ha-ha only serious); also known as `semi-smiley' or `winkey face'.
;-/
'wry face'

The need to find abbreviated means of sending text messages on mobile phones has meant an explosion of typographic *argot* recently, with whole dictionaries of txtmsgs published.
There are also hundreds of acronyms, some of which double for emoticons, e.g. <G> = grin, <S> = smile, <G,D,R> = grinning, ducking and running. It is common to put actions in diagonal brackets, thus: <smiles>, <laughs>, <hugs>. Other acronyms include:
LOL = Laughing Out Loud
ROFL = Rolling On The Floor Laughing
IMHO = In My Humble Opinion
BTW = By The Way
OTOH = On The Other Hand
And so on and so on.

8. MUDs, MOOs and MUSHes
MUD is an acronym for Multi-User Dungeon, or Multi-User Dimension, or Multi-User Domain. These are essentially real-time chat forums, but with structure; they have multiple 'locations' like an adventure game, and may include combat, traps, puzzles, magic, a simple economic system, and the capability for characters to build more structure onto the database that represents the existing world. The first MUD was created by Richard Bartle and Roy Trubshaw on the University of Essex's DEC-10 in the early 1980s. Students on the European academic networks quickly improved on the MUD concept, spawning several new MUDs (VAXMUD, AberMUD, LPMUD). Many of these had associated bulletin-board systems for social interaction. Because these had an image as 'research' they often survived administrative hostility to BBSs in general.

A MOO is an object-oriented MUD, particularly suited to virtual reality experimentation and a fertile hunting-ground for literary creation. Nottingham Trent University's 'trAce' experimental writing project (http://www.trAce.ntu.ac.uk), for example, makes considerable use of LambdaMOO as a way of generating new narratives, styles, characters and environments. A MUSH (Multi-User Shared Hallucination) is a MUD derived from a shared imaginary reality, usually a book or a film (*Star Trek* being a classic example). This is perhaps less creative than a MOO, since the partcipants adopt known avatars, however it has the merit that it is not essential to define every aspect of one's virtual world before enjoying the roleplay.

9. Avatar

The word comes from Hindu mythology, where it refers to the incarnation of a god. Among people working on virtual reality and cyberspace interfaces, an avatar is an icon or representation of a user in a shared virtual reality. In roleplaying forums, MUDs and MOOs, the avatar has become a kind of alternative persona, and there are many people online who argue that every internet presence is an avatar in some sense. Indeed it is possible to manufacture an internet persona for oneself even using email alone, and it is not uncommon in offices or on intranets to find people saying things in email which they would never dare say face-to-face. In general, these kinds of avatar tend to be less agreeable than the 3D person, because of their inexperience in online projection.

10. Rhizome

In 'Mille Plateaux' (1980), Gilles Deleuze and Felix Guattari draw up an imaginary blueprint for a 'rhizome' which opposes 'smooth' and 'striated' space. The internet might be seen as an example of such a rhizome, and the 'dot.com revolution' as an attempt to striate this smooth space. Although Deleuze and Guattari do not refer at all to the internet, many of the issues they raise about the way capitalism and society operate are the focus of discussion online.

A rhizome is a system of tubers growing horizontally. This forms an important metaphor that Deleuze and Guattari oppose to the more traditional 'vertical' structures of knowledge, which are tree-like, with roots:

"The rhizome is a concept of social order defined by active transversal or encounter rather than objectification... Figures for this order include the ocean of the navigator or the desert of the nomad."

They also list six principles of the rhizome: "connection, heterogeneity, multiplicity, asignifying rupture, cartography, and decalcomania". A very brief summary of these ideas suggests that: any point of a rhizome system can be connected to any other point; it is not hierarchical in structure; no point comes before another; no specific point is connected to another point, but all points are and must be connected; it may be shattered at a given spot, but will start up again on one of its old lines, or on new lines; it is a map with multiple entry points; it "constructs the unconscious" by orientation "toward an experimentation of contact with the real."

11. Distributed networks and packet-switching

A centralized network is one in which all links connect to a central point. A decentralized network is the same idea, but with many different central points. A distributed network on the other hand is made up of nodes connected by 3 or 4 links to other nodes in a continuous lattice. Packet-switching was invented by Donald Davies (UK) in 1965. His idea was to create a new public communications system exploiting digital computers. Messages are split into data 'packets' for transport across the network and reassembled at the destination according to information defining the packet.

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