JoSTrans
The Journal of Specialised Translation

www.jostrans.org · ISSN: 1740-367X

Kayahara, M. (2005). The Digital Revolution: DVD Technology and the Possibilities for Audiovisual Translation Studies. *The Journal of Specialised Translation, 3*, 45-48.
https://doi.org/10.26034/cm.jostrans.2005.795

The Digital Revolution: DVD Technology and the Possibilities for Audiovisual Translation Studies

Matthew Kayahara
School of Translation and Interpretation, University of Ottawa

ABSTRACT
One of the limitations previously imposed on audiovisual translation studies was the physical nature of the material: videocassettes wear out easily, and require theorists to obtain multiple copies of the same film. This problem has been resolved with the advent of DVD technology, which is more durable than cassette and offers multiple language versions on the same copy. At the same time, the format introduces a range of new questions into audiovisual translation studies. This paper seeks to raise these questions, which range from the mundane (access to some versions is restricted by region codes) to the theoretical (how does DVD affect the translation process?).

KEYWORDS
audiovisual translation, DVD, subtitles, subtitling, dubbing, technology

> The reluctance to work with the film itself is, of course, understandable because of the tedious process of winding and rewinding necessary to deal with even just a few words (research into audiovisual translation must be one of the few areas where there is a real risk of wearing out one's source material and where several hours' work may produce only minimal results) (Fawcett, 1996:67).

This observation may have seemed apt in 1996, but in making it, Fawcett failed to predict a change that would come to the home video market over the years that followed: the emergence and expansion of DVD (digital versatile disc). This format for viewing audiovisual texts, which has only recently become widespread, is more durable, more economical, and more convenient for audiovisual translation studies than videocassette. It also responds to the concerns Fawcett expresses here: it obviates the process of winding and rewinding, it doesn't wear out, and it renders it unnecessary for the theorist to buy or rent multiple copies of a given audiovisual text in order to compare the dubbed version of the film to the original or to the subtitles. But in addition to these material issues, there is a number of theoretical factors that come into play when DVD is considered. For example, the suddenly wide availability of language versions of films, both subtitled and dubbed, means that many more viewers are equipped to explore any latent interest in these phenomena than before, rendering the job of audiovisual translation theorist much more applicable to the "real world" than has often been considered to be the case until now. Moreover, DVD facilitates research methods that have been technologically difficult until now, such as comparing the dubbed version of the film to the subtitled version in real time, or using the director's published commentary to gain insight into the cultural value of a film. Naturally, DVD does not solve every problem in audiovisual translation studies, such as the availability of scripts or of a given

language version. Nevertheless, the advances presented by DVD, combined with the ways in which the format is revolutionizing filmmaking on the whole – to the point that there is potential for it to become an expressive medium entirely independent from film, of the type Janet H. Murray calls "hypertext narratives" (1997:55-56) – imply that the face of audiovisual translation studies will never be the same.

1. What is a DVD?[1]

A DVD is quite simply a small plastic-and-metal disc that looks much like a CD. However, thanks to advances in laser technology and the fact that it can use both sides of the disc and two "layers" on each side, a DVD can store a maximum of about 17 Gigabytes of information, compared to approximately 700 Megabytes for a CD. In filmic terms, this storage capacity translates into approximately 8 hours of film or TV – with a higher picture resolution and better sound quality than a VHS videocassette, with some sources estimating a capacity of 30 hours at the same level of quality as VHS (Taylor, 2004, section 1.2). Moreover, because DVDs are optical media, there is no mechanical contact between the disc and the player, they cannot be erased by electromagnetic fields (as VHS cassettes can), they do not substantially degrade over time, and they do not need to be rewound. Also, much as the track selection on a CD does, DVDs offer instant access to different scenes in a film (subject to the production company placing bookmarks on the disc), which obviates the tedious process of winding and rewinding about which Fawcett complains. In short, DVDs are a more durable, higher-capacity, easier-to-use form of storage for audiovisual texts than VHS is: they have solved Fawcett's problem of "wearing out one's source material".

Of course, there are very few eight-hour movies in existence; the DVD Forum, the technical organization that supervises the standards for DVD production, estimates that 92% of all Hollywood films will fit on a single layer of a single side of a disc (DVD Forum, "DVD Technology FAQs"). This could have resulted in substantial amounts of extra space being left on most DVDs. Fortunately, the designers of the DVD technology took this issue into account in their specifications for the format. Consequently, DVDs have the ability to contain much more than simple films: they can also include interactive menus for selecting specific scenes or playing simple games; instant search capability to advance to different scenes in a movie; and, most importantly for our discussion, up to 8 different audio tracks and 32 different subtitle tracks (Taylor, section 1.2). Usually, though not always, these last two features are used to include tracks in languages other than the original – which means that dubbed and subtitled films are suddenly widely available, and are now almost *de rigeur* for newly released movies.

This fact addresses, in part, what Fawcett refers to as the "Quantum Theory Problem," which he sums up as a problem rooted in audiovisual translation studies as an academic pursuit, whereby "the process of

analysis alters our focus and what we find, so the results we are looking at are not those perceived by the non-analytic reader or spectator" (1996:69-70). In other words, the general viewer, not being sensitive to the issues involved in translation studies, may have no problem with a given translation, where the translation theorist finds much to comment on – a perspective which implies that translation studies has little relation to the "real world." While it may still be true that the perspective of translation theorists is not the same as that of non-analytic spectators, the suddenly wide availability of multiple language versions of a film might help to increase the number of *analytic* spectators, especially among people with English as their mother tongue, a group that tends to drive the Hollywood-dominated film industry. In the past, the only economical avenue available for most viewers to compare filmic source text and translation was to buy or rent the subtitled or dubbed version of the film, and for films that were originally produced in the viewer's mother tongue, that was extremely unlikely to happen. After all, why would I, as an Anglophone who speaks French, buy the French subtitled version of *The Shawshank Redemption*? I would not want to have to watch the French subtitles every time I viewed the movie. However, with DVD, the only version available to me includes the French subtitles, which means that it is much more convenient for me if I want to look at them out of curiosity.

The wide availability of subtitles and dubbing soundtracks on DVDs has a number of impacts on audiovisual translation studies, the most pragmatic of which is that it relieves some of the economic burden on translation theorists: they no longer have to rent or buy multiple copies of a given movie in order to compare, say, the original English to the French dubbing. Instead, they can simply insert their single DVD into the player, select which sound and subtitle tracks they want to view, and press play.[2] Moreover, forms of conducting research that would have been extremely onerous with videocassette have become exceptionally easy with DVD. For example, one could select both the English dubbed soundtrack and the English subtitles to compare the one directly against the other, in real time. This can produce interesting results. It was recently brought to my attention that the dubbed version of the classic anime (Japanese animated film) *Ghost in the Shell* was faulty, because there was a biblical reference which had been overlooked in the dubbing, but which had been noticed and "translated" correctly in the subtitles. To examine this mistake, I put the DVD in the player, selected English audio and English subtitles, selected Chapter 7, and watched. I did not need to have separate dubbed and subtitled versions of the film, and I did not need to watch the same material twice, which cut down on my time commitment. It also did not take very long to find the scene I was looking for, thanks to the ability to easily select a specific scene through the menus. Using a DVD, I quickly determined what the problem was: the dubbing translator had referred to the Good News Bible, while the subtitle translator had used the King James Version.

This was not the only place where the subtitles and the dubbing audio track diverged: in fact, my viewing revealed that the two hardly corresponded at all throughout the film. Using the VHS medium, such a viewing would be difficult at best, since it seems highly unlikely that a distributor would offer a dubbed *and* subtitled version of a film on videocassette. There's no market for such a product; the major binary in audiovisual translation is the choice *between* these two techniques. Nonetheless, the ease with which the two can be viewed simultaneously on DVD raises some interesting questions for the translation process: are there different translators providing the language-version voice track and the subtitles? If, so are any efforts made to see how they compare? How does the fact that many locales have an established preference for one form of audiovisual translation over another (Shochat and Stam 46) affect the quality of the translation if the studio decides it wants both to be included in the DVD? Do the translators take into account the possibility that both may be viewed at the same time, and does this have any impact on their choices? My experience with *Ghost in the Shell* provided an opportunity to see how the subtitles and dubbing translation often complemented each other in such a way that when one seemed vague or incomprehensible, the other made up for that lack; could this fact be leveraged in any way by translators?

Naturally, this (entirely optional) procedure of simultaneously viewing the DVD dubbing track and the subtitles is valuable not only for an audience interested in a more complete translational experience, or a more critical audience interested in picking out errors in the translation, but also for an academic audience interested in locating differences between dubbing and subtitling rooted in the formal constraints of post-synchronization and concision, respectively. While these constraints are often discussed, almost to the point of being taken for granted, there seems to be little published material analyzing them in detail. On a broader level, this type of analysis could be used to differentially examine norms in subtitling and dubbing. While it is possible to engage in such a viewing on VHS for academic purposes, doing so involves, first, having copies of both versions of the audiovisual text and, second, noting time indices of interesting moments and lining up the two videocassettes to the same point to compare them. This procedure certainly does not encourage the viewer to compare the subtitles *directly* to the dubbed text; instead, it relies on the viewer identifying interesting moments in the subtitling or dubbing vis-à-vis the source language – with the techniques usually involved in conducting such an analysis – or requires the theorist viewing the two versions on adjacent televisions. While I hesitate to use the word *passive*, being able to watch a film with the subtitles and dubbing on the same screen allows the viewer to rely on the inherent contrast between the two translation formats to highlight interesting moments.

Of course, subtitles and dubbed tracks are not the only extra material included on DVDs. Often, the film studios will include material such as

commentary tracks that offer the production team's interpretation of why the movie was produced in the way it was, or documentaries and featurettes on how the film was made, how certain special effects were achieved, and so on. In some cases, such as *Shrek* or *Princess Mononoke*, there is even information on the translation of the film: with *Shrek*, in the form of a documentary containing information on how voice actors were selected for the different language releases; with *Princess Mononoke*, in the form of a brief interview with the translator. While this last example doesn't seem to be very common, this general type of material could nonetheless be extremely useful for all film studies theorists (a category which certainly includes audiovisual translation theorists) since it can provide insight into the semiotics of the film, which is useful in examining it from a cultural difference perspective.[3] Moreover, in some cases – for example, *Ghost in the Shell* – the production team does not speak the language of the target audience, which means the interviews included in these documentaries must be subtitled or dubbed. This translates into more work for translators.

2. Information Wants To Be Free[4]: Ideological Issues of the Medium

A DVD is nothing more than an artifact of technology, but if there is one thing that the late 20th and early 21st centuries have shown us, it is that technology is driven by ideology. One of the major driving forces behind DVD technology is control: DVDs offer film studios more control than ever before over how, where and when film content is used. A number of technological features have been implemented in the design of DVDs to ensure this control, but the two most important ones are encryption and regional codes.[5]

Encryption is a mathematical process by which data is rendered unreadable to anyone who does not possess a certain piece of information, known as a "key". In the case of DVD encryption, known as the Content Scramble System (CSS), the data on the disc (i.e., the film and any extras) is scrambled, and only authorized DVD device manufacturers are given the keys to unscramble the content. This kind of control is exerted over DVD content because the digital nature of the format makes it much easier to illegally copy movies from DVD. The DVD Copy Control Association, the corporation that licenses CSS keys to DVD player manufacturers, points out that, "without sufficient protections, movie studios would not have offered their copyrighted films to consumers in this high quality digital format. Because they are 'digital', DVDs can be used as a perfect master for an infinite number of exact copies if the master is not protected by a system like CSS" (DVD Copy Control Association). These perfect, illegal copies could be easily distributed over the Internet – particularly when combined with programs such as DivX, which allows the digital video files to be compressed sufficiently to be manageably stored and distributed online (Taylor, section 4.8). It seems clear that part of this desire for control was based on lessons learned from

the CD industry. The original specification for CDs contained no copy protection, and as a result CDs have been pirated with more and more regularity in recent years.[6] The creators of DVDs do not want a similar fate to befall them. Unfortunately for them, the CSS encryption scheme was "cracked" in October 1999.[7]

One result of the relative ease of copying DVD movies to computer is that viewers can re-edit them without having to buy the expensive equipment normally associated with film editing. Re-edits of movies have already been seen; one notable example, known as *The Phantom Edit*, is a fan edit of George Lucas' *Star Wars I: The Phantom Menace*, and is widely available on the Internet.[8] By extension, there is a clear implication for translation: DVD technology makes it very easy for fans to produce their own language versions of films. This phenomenon is widely seen with subtitling in the world of anime, where it is known as "fansubbing." The reasons given for fansubbing usually include a desire to make minor films (that go unnoticed by the major distribution companies) more widely available to non-Japanese speakers; to have minor films noticed, and hopefully redistributed, by the major companies; and to make available a subtitled version where only a dubbed version exists (Gray, section I-a, question 2).[9] While anime is a very specific genre with an almost cult-like following (and a following for which translation is of the utmost importance), it is entirely possible that, thanks to DVD, other genres will pick up on fansubbing, thus providing a more diverse field of source material for audiovisual translation theorists to work with, and raising the visibility of subtitling as a practice.

While the digital nature of DVDs allows fans to add subtitles, the process can also work in reverse, to great benefit: now, theorists can obtain a printed copy of the studio's subtitles without having to tediously transcribe them – they can simply be "ripped," using software designed for this purpose. This provides him or her with an invaluable research tool and saves a great deal of time. Of course, this technique is subject to the same copy protection constraints as other aspects of DVD technology; consequently, control over subtitles will rise or fall on the same waves as control over DVD images and sound.

Encryption is not the only form of technological control used by DVD manufacturers. Another important one is "region codes." Every DVD and every DVD player contains information tying it to a certain region of the world.[10] A DVD coded for any one of these regions will play only on a DVD player that is coded as being from the same region. This technology exists in order that film studios can maintain a different distribution schedule for each region: in some cases, a film may be released to video in the US before it is even released to theatres in other parts of the world; region codes allow studios to control release schedules without worrying that one market could get access to a film before it is "allowed." Without region codes, viewers in New York would have to wait until the theatrical

run of the film is over in Tokyo before the DVD would be released (DVD Copy Control Association). It should be noted that, much like with CSS, region codes have been broken as well: some manufacturers sell DVD players that are not region coded, or that can be modified by the user (physically or electronically) to act as if they are not region-coded (Taylor, section 1.10). While these players are technically legal, they do violate the intent of the region coding, and there is some evidence that industry associations are attempting to create new initiatives to frustrate the manufacturers of region-free DVD players (ZoneFreeDVD).

Regional coding has some interesting implications for the translation of films. First of all, it may affect the translation schedule of a given film, though the way in which this would function is somewhat unpredictable. From one perspective, the studio could proceed with translation at a more leisurely pace, since they can delay the release of a film to foreign markets with some assurance that viewers will not be able to see the film before it is released; alternatively, it may be necessary to speed up the translation process in order to have the language tracks available for the domestic DVD before the film is scheduled for release in the foreign market.

The more important translational implication of region codes, however, is the questions it raises as to how languages are chosen for the DVD release. Presumably, the language tracks included on a given DVD are at least partly a function of the market into which the product will be released. For example, many region-1 DVDs with foreign language soundtracks and subtitles include French and Spanish; this makes sense, since Quebec is included in the region 1 market, and there is a large Spanish-speaking population in the US. Unfortunately, the corollary to this is that regions which do not have sizable markets of a given language group will not have translations in that language released in that region. This limitation could have a detrimental effect on audiovisual translation studies: it makes it rather difficult – although not impossible – for an audiovisual translation theorist in Canada to study, say, the Czech translation of *The End of the Affair*, since that subtitle track is available only on the region 2 DVD, and Canada is in region 1.

3. The Future

There is little question that DVD technology is changing the way films are made. As long ago as 2002, The *Los Angeles Times* was reporting on the phenomenon, quoting director Brett Ratner as saying:

"I'm thinking about the DVD as I'm making a movie. Things I'm going to put on it. Picking takes for the movie and for the DVD. I even remixed the sound for 'Rush Hour 2' for the DVD, because we have different kinds of sound equipment in the theater and at home. It was a way to enhance that experience." (Natale, 2002)

Janet H. Murray, in her book *Hamlet on the Holodeck: The Future of Narrative in Cyberspace*, compares the current state of online narrative to early films. Filmic "incunabula," also known as "cradle films" or "photoplays," tended to be no more than a static camera pointed at a stage where a play would be performed. Murray terms this an "additive art form"; that is, photoplays added photography to theatre. Over time, however, things changed:

"In the first three decades of the twentieth century, filmmakers collectively invented the medium [of film] by inventing all the major elements of filmic storytelling, including the close-up, the chase scene, and the standard feature length. The key to this development was seizing on the unique physical properties of film … By aggressively exploring and exploiting these physical properties, filmmakers changed a mere recording technology into a more expressive medium." (Murray, 1997:66)

Murray suggests that current narratives written for computers are in a similar stage of development: the unique properties of computer storytelling have not been seized upon yet to create an expressive medium. Instead, digital authors simply exploit some of the features of computers, taking advantage "of the novelty of computer delivery without utilizing its intrinsic properties," (ibid:67) and creating what is commonly referred to as "multimedia." The unique properties that Murray identifies as intrinsic to digital environments are their nature as procedural (they "exhibit rule-generated behaviour"), participatory (they are "responsive to our input"), spatial (they "represent navigable space"), and encyclopedic (they are "the most capacious medium ever invented"; Murray concedes that this is a difference more of degree than of kind [ibid:71-88]).

From a certain perspective, DVD players are nothing more than simple computers. Indeed, they exhibit all of the characteristics Murray identifies for digital narrative environments: DVDs are procedural in that pressing a given combination of buttons on the remote control will always produce the same effect; they are participatory in that they require a user to press those buttons; they are spatial in that they portray a navigable series of menus that are spatially related to each other and in that the DVD format offers the potential for different camera angles during a given scene; and they are encyclopedic in that they can store enormous amounts of information. Currently, DVDs are simply incunabula as well; they are additive art of the form "movie plus extras." Eventually, it seems likely that DVDs, as with other digital narrative environments, will develop into more complex expressive art.

Some filmmakers suggest that this is already happening, and point to films such as *The Phantom Edit* (Natale, 2002) and projects such as "Wizard People, Dear Reader" (Radosh, 2004) as examples. But it is not just on external devices that such re-editing can happen. The technology has already been included in the DVD specifications to have multiple

narrative threads for a given movie; this technology is known as "seamless branching" (Taylor, 2004, section 1.2). This possibility of "multiform narrative" can have a range of applications. In the case of the movie *Clue*, there are three different endings which were produced. On the VHS release of the film, the three endings are simply played sequentially, with the message "Or, here's how it could have happened" interposed. However, on the DVD release, the viewer has the choice to view all three endings, or to seamlessly integrate one random ending. There are more pragmatic applications of this technology as well, such as allowing viewers to view different edits of the movie (for example, the AA-rated version or the R-rated one), but there are also more creative ones, such as allowing them to choose the path the hero will take or to view the movie from the perspective of different characters.

The implications of multiform narratives on translation could be profound, but they are hard to predict. Obviously, if this technology is only used to release different editions of the movie on the same disc, then on one level that will simply give translators more material to translate. However, one can imagine more radical and creative uses for branching technology: how about a World War II film where the viewer can choose between the perspective of the German soldiers and the American POWs? Could there be different language perspectives as well – say, using the German soundtrack (perhaps with English subtitles) while watching the film through the perspective of the Germans, and the English one (with German subtitles) while watching through that of the Americans? What about when the Germans and Americans are talking to each other – what language do they use to communicate, and how is it represented in subtitles? This conception plays off of a long tradition of multilingual films that use subtitles to cover only certain parts of the film, or subtitles in different languages to cover various parts of the film.

Even before such changes in the medium are taken into account, though, there are still many ways in which the DVDs can improve the way audiovisual translation studies are done, if theorists choose to take advantage of them. As they exist today, DVDs are a cheaper way of doing audiovisual translation studies than videocassette, since only one DVD is needed, while two or three videocassettes would be needed to compare the original, dubbed version, and subtitled version. Moreover, DVD is more durable than videocassette, so it won't wear out over repeated screenings, and it can help with approaches to audiovisual translation studies that have been difficult until now, such as direct, real time comparisons between the dubbing soundtrack and the subtitles. There are also creative benefits that DVD can provide, such as a wider subtitle- and dubbing-sensitive audience, with a concomitant appreciation for the issues that audiovisual translation studies, and, with the ease of copying DVDs to computer, the possibility of creating their own subtitles and even their own versions of films. Certainly DVDs are not a panacea: there are still many limitations facing audiovisual translation theorists, such as the

lack of script availability, and if production companies have their way and all-zone players are banned, DVDs may yet render certain language combinations completely unavailable, through the system of regional codes. Still, much in the way that electronic corpora have made the jobs of lexicographer and terminologist easier by providing smoother, more robust access to their source material, DVD has the potential to substantially facilitate the job of the audiovisual translation theorist.

REFERENCES

Clarke, Roger. "Information wants to be free." Aug. 28, 2001. <http://www.anu.edu.au/people/Roger.Clarke/II/IWtbF.html> (August 30, 2004).

Clue. Dir. Jonathan Lynn. 1985. DVD. Paramount, 2000.

DVD Copy Control Association. "Frequently Asked Questions (FAQ)." n.d. <http://www.dvdcca.org/faq.html> (August 30, 2001).

DVD Forum. "DVD Primer." Aug. 19, 2004. <http://www.dvdforum.org/faq-dvdprimer.htm> (August 26, 2004).

DVD Forum. "DVD Technology FAQs." Aug. 19, 2004. <http://www.dvdforum.org/faq-tech.htm> (August 26, 2004).

Fawcett, Peter. "Translating Film." *On Translating French Literature and Film*. Ed. Geoffrey T. Harris. Amsterdam/Atlanta: Rodopi, 1996. 65-88.

Ghost in the Shell. Dir. Mamoru Oshii. 1995. DVD. Palm Pictures, 1998.

Gray, Chris. "The Fansub FAQ Part I-A: General Information." 1 Apr. 1999. <http://www.fansubs.net/fsw/general/faq1a.htm> (Aug. 26, 2004).

Murray, Janet H. *Hamlet on the Holodeck: The Future of Narrative in Cyberspace*. New York: Free Press, 1997.

Natale, Richard. "Press Play to Access the Future." *Los Angeles Times*. [online] 7 Apr. 2002. <http://www.calendarlive.com/top/1,1419,L-LATimes-Movies-X!ArticleDetail-55354,00.html> (8 Apr. 2002).

Princess Mononoke. Dir. Hayao Miyazaki. 1997. DVD. Miramax, 2000.

Radosh, Daniel. "Harry Potter: The digital remix." *Salon.com*. June 22, 2004. <http://www.salon.com/ent/feature/2004/06/22/harry/> (Jun. 22, 2004).

Shochat, Ella and Robert Stam. "The Cinema After Babel: Language, Difference, Power." *Screen* 26.3-4 (May-August 1985): 35-58.

Shrek. Dir. Andrew Adamson and Vicky Jenson. 2001. DVD. Dreamworks, 2001.

Taylor, Jim. "DVD Frequently Asked Questions (And Answers)." Aug. 13, 2004. <http://www.dvddemystified.com/dvdfaq.html> (Aug. 30, 2004).

The End of the Affair. Dir. Neil Jordan. 1999. DVD. Columbia/Tristar, 2000.

The Shawshank Redemption. Dir. Frank Darabont. 1994. DVD. Warner, 1999.

ZoneFreeDVD. "Code Free DVD FAQs." 1997-2003.

<http://zonefreedvd.com/codefreedvd/regionfreedvdfaq.html> (Aug. 26, 2004).

Endnotes:

1. Unless otherwise noted, all technical information in this section is taken from DVD Forum, "DVD Primer" and "DVD Technology FAQs".
2. When this paper was first submitted, it was pointed out to me that the economic burden was not alleviated, but merely transferred, since the audiovisual translation theorist would now have to buy a DVD player. There are two responses to this: first, the price of DVD players, as with all technology, have dropped significantly as they became more and more widespread. Second, as VHS has now been mostly phased out by the film studios, all viewers have little choice but to buy DVD players to watch movies.
3. Of course, the importance one ascribes to such featurettes depends entirely on the priority one grants to authorial interpretations of the text.
4. This is a common expression among certain factions of the computing community, intended to highlight the futility of trying to control the flow of information online. For more information, see Clarke.
5. There are many more types of control used by DVD manufacturers than can be discussed here. For more information, see Taylor, section 1.11.
6. The most famous case of this involved a company and software product known as Napster. There is much information about the company on the World Wide Web. See for example <http://www.napster.com> and <http://www.salon.com/tech/feature/2000/02/03/napster/>.
7. For more information on the case, see <http://www.2600.com/dvd/docs/>.
8. For more information on *The Phantom Edit*, see <http://www.salon.com/ent/movies/feature/2001/11/05/phantom_edit/>.
9. See also the section "DVD" under <http://armitage.crinkle.net/karinkuru/howtosub/a1.html>.
10. There are eight such regions: 1: USA and Canada; 2: Japan, Europe, South Africa, Middle East; 3: Southeast Asia and East Asia; 4: Australia, New Zealand, Mexico, Central America, South America, Caribbean; 5: Eastern Europe, India, Africa, North Korea, Mongolia; 6: China; 7: Reserved; 8: International Venues, such as airplanes. There are also "all-region" discs and players (see Taylor, section 1.10).

Matthew Kayahara is a graduate of the School of Translation and Interpretation at the University of Ottawa, where he has taught courses in translation technology and recently completed his MA in Translation. He has worked in the software localisation industry and is currently working as a translator in the banking industry.