Mara Logaldo*

Augmented Bodies: Functional and Rhetorical Uses of Augmented Reality in Fashion

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Abstract: Augmented Reality (AR) is increasingly changing our perception of the world. The spreading of Quick Response (QR), Radio Frequency (RFID) and AR tags has provided ways to enrich physical items with digital information. By a process of alignment the codes can be read by the cameras contained in handheld devices or special equipment and add computer-generated contents – including 3-D imagery – to real objects in real time. As a result, we feel we belong to a multi-layered dimension, to a mixed environment where the real and the virtual partly overlap. Fashion has been among the most responsive domains to this new technology. Applications of AR in the field have already been numerous and diverse: from Magic Mirrors in department stores to 3-D features in fashion magazines; from augmented fashion shows, where models are covered with tags or transformed into walking holograms, to advertisements consisting exclusively of more or less magnified QR codes. Bodies are thus at the same time augmented and encrypted, offered to the eye of the digital camera to be transfigured and turned into a secret language which, among other functions, can also have that of becoming a powerful tool to bypass censorship.

Keywords: augmented reality, augmented fashion, tags, censorship, encrypted bodies, secret language, holograms

Augmented Reality (AR) is a relatively new technology founded on the assumption that we live in a mixed environment. The adjective "mixed" here has two interrelated meanings: a technical meaning and an ontological one. On the one hand, we have the combination of physical and virtual objects made possible by ubiquitous computing, tagging and systems of geolocalization, which allow people and things to be constantly connected with on-line information that can be converted into digital texts and images. On the other hand, due to the influence the Internet has on everyday life, we have a constant process of interaction between online and offline experiences: blogs, photos, videos no longer merely belong to virtual space but

***Corresponding author: Mara Logaldo,** International University of Languages and Media, Milan, Italy, E-mail: mara.logaldo@iulm.it

actively interact with the real environment. As a result, the boundary between the two dimensions has increasingly blurred, thus leading to the notion of mixed environment or hybrid ecosystem.[1]

Obviously, to be augmented is not the reality itself but the perception of the real.[2] For instance, the appearance of three-dimensional virtual contents from physical objects – made possible by a process of spatial and temporal alignment between the tag code and the digital camera – may produce a more intense and often surprising experience of the surrounding world. Also the possibility of connecting anytime and anywhere to web pages that are semantically related to the world of actual things has amazing potential. At the same time, as already suggested, most of the digital contents available have already been or are being cognitively experienced online, processed and shared within communities of interest through blogs and social networks, even measured with folksnomic tools such as tag clouds and twitters.[3] Therefore the technical augmentation occurs in a reality already perceived as a mixed ontospace.[4]

Until a few years ago both scientists and researchers in the humanities emphasized the idea that AR technology was aimed at totally immersive sensory experiences.[5] What it was trying to achieve was a flawless fusion of the real world with the virtual one. The "seams and joints"[6] between existing physical data and computer-mediated ones were not meant to be felt. The three-dimensional effect could be attained either with the aid of special equipments (goggles, gloves, etc.) or with the creation of virtual, circumscribed environments such as virtual caves. It could also be obtained, as Rolf Hainich suggests, by making parts of the superimposed virtual contents transparent so that the

1 Paul Milgram and Fumio Kishino, "A Taxonomy of Mixed Reality Visual Display," *Institute of Electronics, Information and Communication Engineers, Transactions on Information & Systems* E77-D 12 (1994): 1321–1329; Ronald Azuma, "A Survey of Augmented Reality," *Presence* 6.4 (Cambridge, MA: MIT Press, 1997): 355–385; Kai Pata, "An Ontospatial Representation of Writing Narratives in Hybrid Ecosystem," *2010 Workshops on Database and Expert Systems Applications* (Dexa, 2010), 87–91.

2 Olivier Hughes, Philippe Fuchs, and Olivier Nannipieri, "New Augmented Reality Taxonomy. Technologies and Features of Augmented Environments," in *Handbook of Augmented Reality*, ed. Borko Fuhrt (New York: Springer, 2011), 47.

3 Blake Shaw, "Utilizing Folksonomy: Similarity Metadata from the Del.icio.us System CS 6124 Project" (December 9, 2005), accessed December 12, 2014, http://www.metablake.com/webfolk/web-project.pdf.

4 Pata, "An Ontospatial Representation of Writing Narratives in Hybrid Ecosystem."

5 Mark Poster, *The Information Subject* (Singapore: Stanley Aronowitz Books, 2001), 79.

6 Rolf Hainich, *The End of Hardware. Augmented Reality and Beyond* (Lexington, KY: BookSurge Publishing, 2009), 17.

underlying real object might be seen through, or by overlaying a picture of the real object over the picture of the virtual object.[7] With time, however, the focus has gradually shifted to the awareness that the meaning of AR lies precisely in its being a mixed experience that takes place in an in-between space.[8] Nowadays people are probably no longer in search of the perfect illusion, also because technology itself has become second nature, a permeable interface.[9] Consequently, "the augmentation does not need to be technically perfect. Reality itself has never looked 'technically perfect'."[10]

Starting from this statement, what is important to define is not just the different paradigm engendered by the superimposition of physical and virtual objects, but the process by which we acquire a sort of augmented vision.[11] As already remarked, this does not depend on a perfectly consistent 3-D perception of a world that incorporates the virtual into itself. In fact, the function of augmented vision is primarily that of making *simultaneously* sense of the several layers our mixed reality consists of. On this account it is interesting to notice that, while early studies tended to represent AR as an intermediate section on an unbroken line spanning between two poles, respectively the real environment and augmented virtuality,[12] more recent research has highlighted that it would be better represented as an experience involving a partial overlapping of planes. Rather than place it at an intermediate point between the real and the virtual world, these studies draw from the assumption that the modification of sensory space in AR derives from the extemporaneous perception of a multi-layered context.

The superimposition of levels, however, does require significant adjustments. The interaction of real and virtual space can actually be a very complex process, both from the purely technical and the cognitive points of view. In the first place, as Olivier Hughes *et al.* have shown,[13] virtual objects can either be "encrusted" onto or "integrated" into the real environment. "Encrustation" involves that the virtual object is visibly superimposed, "stuck," as it were, to

7 Hainich, *The End of Hardware*, 47.

8 On the subject of "in-between space," see Silvano Tagliagambe, *Lo spazio intermedio* (Milano: Università Bocconi Editore, 2009).

9 J. David Bolter and Richard A. Grusin, *Remediation* (Cambridge, MA: MIT Press, 1999), 42.

10 Bruce Sterling, "AR," (Italy) *Wired* (December, 2009), 142.

11 Cf. Reinhold Behringer, Gudrun Clinker, and David W. Mizell eds., "Augmented Reality: Placing Artificial Objects in Real Scenes," in *Proceedings of the International Workshop on AR '98* (Natick, MA: AK Peters Ltd., 1999).

12 Milgram and Kishino, "A Taxonomy of Mixed Reality Visual Display."

13 Hughes *et al.*, "New Augmented Reality Taxonomy," 47.

the real environment or, vice versa, that the real object is superimposed over the virtual environment. In either cases, the virtual object remains distinct from the real one. Integration, on the contrary, entails that the virtual object is, as far as possible, assimilated to the surrounding context or that, conversely, the real objects is as far as possible assimilated to the virtual environment.

What the authors of this taxonomy try to underline is that the wide range of intermediate modes by which real and virtual planes may interact entail different kinds of functionality. In fact, assuming the Bergsonian idea that perception is always finalized to some sort of action, Hughes *et al*. argue that "AR can offer interfaces which propose, either, more explicitly, information, or, more implicitly, a better mastery of our actions with regard to real events."[14] At the one end we have the real and the virtual kept in two separate "boxes," which corresponds to functionality ø; at the opposite end we have their highest form of integration, for example when virtual objects acquire the same properties (gravity, elasticity, fluidity, etc.) of real ones, which corresponds to the maximum level of functionality (functionality 2).

However, beside the functional one, there is also an aesthetic side of AR. Indeed, as the authors highlight, another relevant variable is the quality of digital images superimposed on the real environment: they can be documented images of the past and/or future, but they can also be completely deprived of any known source and therefore belong entirely to the category of imaginary worlds. Any kind of virtual scenario can be made to appear in the physical one. During Ralph Lauren's 4-D show at the London Fashion Week in November 2010, to give an example, the façade of a house was first turned into a fairy-tale palace and then into the setting for a game of polo.[15] Of course, these applications have a marketable side.[16] The demarcation between functional and aesthetic aspects is not clear-cut and this is particularly true for the world of fashion, where technology is often used to enhance the appeal of products. Yet, as we shall see later, in fashion AR is principally aimed at achieving beautiful or astonishing effects. In fact, the imagery deriving from the process may in a sense be considered as the visual counterpart of figurative language, metaphor and hyperbole in particular.

The most immediate functional use of AR in fashion can be observed in the introduction of Magic Mirrors in department stores, both on-line and off-line

14 Hughes *et al*., "New Augmented Reality Taxonomy," 48.

15 The video is available at: http://www.youtube.com/watch?v=E7ryMzZQICA (last access August 30, 2014).

16 See Yuniya Kawamura, *Fashionology* (Oxford: Berg, 2005).

ones. This technology is based on the principle of "flawless tracking"[17] which allows the computer screen to act as a looking glass. However, unlike ordinary mirrors that passively reflect whatever is placed in front of them, and unlike ordinary monitors that show images which are independent from the surrounding context, here the display acts as an interface that reproduces what it sees through its digital camera and, thanks to algorithms that measure spatial coordinates and movements, provides the image with additional virtual contents. By placing yourself in front of a Magic Mirror in a virtual fitting room, for instance, you may try a garment choosing between a variety of models, colours and sizes. With the aid of icons and touch screen technology, the display will show an image of yourself wearing that garment in that particular model, colour and size. Clothes will be laid over your image so that you can see how they look on you. Products such as Fashionista™ allow the shopper to interact with the web site using hand gestures to "try on" clothes and then save the chosen garments in a virtual caddy. You can even take a picture of yourself and send it to your best friend for real time feedback. Thanks to Wi-Fi and motion-capture technologies, this mirror can also report movement, so that the process will be completely interactive.[18] The same can be done with hairstyle and make-up.

Magic Mirrors allow the user to experience different identities in a mixed environment: no longer in the web, as avatars totally deprived of substance and direct referential connection to the off-line context, but as hybrid beings consisting of digital information which is added to physical data according to rules of indexicality and semantic continuity. However difficult to define, the concept of semantic continuity is, I would argue, of crucial importance to draw a line between functional and aesthetic uses of AR.[19] Whereas in Magic Mirrors it plays an essential role, since the extra information displayed on the screen must be consistent with your own figure, in ludic[20] or artistic uses of AR virtual contents can be added according to metaphoric rather than metonymic procedures.

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17 Hughes *et al.*, "New Augmented Reality Taxonomy," 29; Devinder Kumar, "Annotation Supported Contour Based Object Tracking With Frame Based Error Analysis," in *3rd International Conference on Machine Learning and Computing (ICMLC 2011)*, accessed February 25, 2015, http://nitw.academia.edu/DevinderKumar/Papers/873958/Annotation_Supported_Contour_Based_Object_Tracking_With_Frame_Based_Error.

18 See http://www.youtube.com/watch?v=rn_iPjGKd0M (last access September 17, 2015); see also http://blogs.oracle.com/retail/entry/augmented_reality_for_fashion (last access May 31, 2014).

19 Cf. Mara Logaldo, *Augmented Linguistics. Language and Communication in the Age of Augmented Reality* (Milano: Arcipelago Edizioni, 2012).

20 An exception should be made for traditional, highly codified games such as chess, soccer, tennis, etc. where the virtual image must be continuous with the real one.

We should also never overlook the fact that technology and aesthetics have long been inseparable in fashion. Technology itself has often been represented as a fashionable object, with aesthetic as well as social implications. Let us recall, for instance, the obsession for the representation of screens in fashion magazines and shows in the 1980s: screens were then considered appealing, both to attain spectacular visual effects and as the embodiment of a narcissistic view of life and society. Conversely, in the age of AR we witness an attempt to break free from screens either by multiplying them *ad libitum*, as in ubiquitous computing, or by transforming them into permeable, liquid interfaces. In fact, the idea that we live in a mixed reality rather than in a dimension that is entirely self-contained can only be represented by overcoming the claustrophobic limitations of "stagnating screens."[21]

A related point stressed in aesthetic uses of AR is that cameras should no longer be used to take pictures of the world that will be watched *after* the event: they have to create the event itself. The monitor becomes a framing tool, an indexical instrument. AR is actually activated by pointing the handheld device at a particular fragment of reality, which is temporarily made to fit into the frame of its display, just long enough for the software to recognise pattern markers and react either by producing digital contents or by connecting the user to the web.

The difference between this use of cameras and the traditional experience of photography is therefore radical. Even if, of course, pictures can still be taken, this is not what AR technology is meant to do. In AR photography is translated into the deliberate gesture of pointing at something as a means to obtain an augmentation of the world. In this gesture we may find, on the one hand, the end of photography conceived as a means to achieve an object (the picture) that reproduces the real, and, on the other hand, the sublimation of photography as action. By acting on the world in real time, this kind of photography is not aimed at producing simulacra that can be watched retrospectively – more or less faithful pictures of people and objects transfigured into memories of past experiences – but at actualizing those very people and objects, interacting with them and making things happen. The process still implies the act of framing parts of

21 "The Safety Glass of the Display is shattered and the Physical and Virtual are united in a new In-Between Space. In this Space is where we choose to Create." Quoted from the "AR Art Manifesto" endorsed by the founding members of the cyberartist group Manifest.AR on 25 January 2011. Accessed September 17, 2015, http://www.wired.com/2011/01/augmented-reality-manifestar-an-augmented-art-manifesto/; see also as the AR video *Exhale* by fashion photographer Will Davidson, available at: http://www.youtube.com/watch?v=tZEIoXaz2tQ (last access May 31, 2014).

the visible world. However, framing what appears in the visual field with a handheld device is perceived as a perfectly normal gesture: we do not feel any incongruence in the fact that we are looking at the world through a display. This is particularly true for fashion shows, where it is perfectly normal to watch a performance through the monitor of a smartphone or tablet.

The use of AR during fashion shows does not simply imply a process of simulation and substitution. Through the framing process body permutations may be visually experienced, while virtual information may come to the foreground, superimposed onto the physical world. Focusing on the theme of the body, it is important to notice that AR seems to make up for the loss of corporeality attributed to on-line experience. The sensory side is here partly recovered.[22] Bodily substance is neither replaced by multiple virtual identities as with the internet, nor immersed in a virtual dimension recreated outside the internet with the aid of equipment that provides a vicarious experience. Paraphrasing Shakespeare, we could say that in AR the body "shows its back above water,"[23] that is, above the underwater world of the web. Hence, rather than as an either unequivocally real or as an unambiguously virtual presence, in AR the body should be considered an amphibious entity which may live in both dimensions at the same time.

The idea of the body as intermittently emerging from the amniotic liquid of the web, at once freed from its claustrophobic dimension but still dependent on it, is strongly reflected by the world of fashion.[24] No longer a bundle of muscles or, conversely, a disembodied ghost, the augmented body appears as a metamorphosizing life form. The skin that contains the organs is still there, though

22 A parallel example of this process can be found in AR locative games, where the body of the player, physically moving in real space, has an active role in performing all the required tasks. As activities used for educational purposes have successfully proved, though the players' eyes seem to be fixed on the messages appearing on their portable displays, movements, sensory experience and body language play a crucial role in carrying out the action. Along with this also oral language, considered no longer as the form of secondary orality experienced in blogs and social networks, recovers in AR its phonetic and bodily substance through viva voce interaction. See Eric Klopfer, Judy Perry, Kurt Squire and Jan Ming-Fong, "Collaborative Learning through Augmented Reality Role Playing," in *Computer Supported Collaborative Learning 2005: The Next 10 Years! Proceedings of the International Conference on Computer Supported Collaborative Learning 2005* (Taipei, May 30–June 4, 2005), 311–315.

23 "His delights/Were dolphin-like; they showed his back above/ The element they lived in" William Shakespeare, "Antony and Cleopatra," in *The Complete Works* (Oxford: Clarendon Press, 1988), 5.2.1032.

24 "Diesel liquid space holographic fashion show." The video is available at: http://www.youtube.com/watch?v=M3KyeIOO_bQ (last access May 31, 2014).

not as a boundary between the self and the surrounding world, but, rather, as a porous membrane that allows the subject to survive in different elements, oozing virtual images and living out-of-the-body experiences. QR or AR tags etched on the skin, for instance, can be read by digital cameras and turned into three-dimensional imagery whose aerial fluctuations are, however, firmly rooted in the flesh. The real body still remains the pivot of virtual experience: the two must mutually support each other.

In fashion shows, where the great revolution consisted precisely in the replacement, in 1858, of dummies with live models by the British couturier Charles Worth,[25] we participate in a new, paradigmatic phenomenon. No longer the one that occurred in the 1930s when bodies – following the aesthetics of Surrealism – were torn apart and made to resemble metaphysical mannequins submitted to visually violent practices;[26] nor the one that was all the rage in the 1980s and 1990s, when the bodies of models were made to feign either the inanimateness of the dummy or the mechanical movements of the *cyborg*[27] – half human, half machine. What we experience with AR is the actualization of the augmented body, at once real and virtual, tangible and elusive. Rather than reminding us of the heaviness usually associated with the mechanical prostheses of the cyborg, the augmentation applied to bodies resembles a vaporous aura, involving an idea of lightness, the partial expansion of the human flesh into the hybrid ecosystem. Although Gibson's and Lévy's idea of the cyborg still persists in the perception of the augmented body, the hybridization is no longer between man and machine but between the physical and the virtual dimension. While in the cyborg emphasis was placed on the hardware considered as a concrete, material dimension, in the augmented body the stress falls on impalpable mathematical formulae, inscrutable algorithms, enigmatic ciphers, the totemic, hypnotic patterns of AR tags and the fascinating arabesques of QR tags. Rather than a violent implantation of mechanical parts into an organism, the human skin becomes the encrypting surface that allows the virtual information to stem from the body; it is the tagged surface offered to the eye of the digital camera to be transfigured.

The ideas of the body as a tool and of the media as its extensions[28] persist in AR, for digital content can certainly be considered as a way by which the body

25 Kawamura, *Fashionology*, 83.

26 Ghislaine Wood, *The Surreal Body. Fetish and Fashion* (London: V&A Publications, 2007), 6.

27 William Gibson, *Neuromancer* (New York: Ace Science Fiction, 1984); Pierre Lévy, *Cyberculture* (Paris: O. Jacob, 1997).

28 Cf. Malcolm McLuhan, *Understanding Media: The Extensions of Man* (New York: McGraw Hill, 1964).

actively expands itself and is integrated with more information. However, the notion of "tool" here loses its mechanical connotations. At most, the functional metaphor is shifted from the human body to the surrounding context, which is now perceived in terms of affordance:[29] the environment seems to invite us to interact with it and it does so by visual stimuli. Actually, AR could not exist without the idea of a constant exchange between the human body and the world. In other words, what we notice in augmented bodies – even in an overt, visible way – is an efflorescence of extra meaning that partakes of the partial fusion of man with the hybrid ecosystem.[30]

In the Burberry Augmented Fashion Show of Beijing (April 2011) all the above-mentioned suggestions seem to be co-present. The four walls of the room are covered with maxi screens. The effect is, in part, that of the virtual cave, where the 4-D experience is meant to be as immersive as possible. This point is emphasized by the fact that the audience, unlike in traditional fashion shows, is standing at the centre of the room rather than at the sides. The onlookers are inside the arena: like gladiators waiting for the lions to come out of their cages, they might be prey to any sort of shocking surprise. On the other hand, we realize that although the experience of the cave is clearly evoked it does not result in a complete plunge into virtual space. The horizontal lines of the projected runways create discontinuous screenscapes. Even the spectacular shower of virtual rain that opens the show is meant to stress the perception of a mixed experience rather than to create a sense of perfect, seamless continuity between the virtual and the actual world. The vertical lines of the falling rain overtly show the fabricated superimposition of planes. As in a sort of *moiré* pattern, it is the interference between the virtual imagery and the living bodies of the models to be stressed. The tension is deliberately kept alive.

During the show, we are never allowed to forget that we are looking at images. This also generates a constant meta-discourse on vision and the optical devices that have altered the act of seeing while enhancing it. The performance actually traces back the history of these optical devices, from magic lanterns to

29 Cf. James Gibson, "The Theory of Affordances," in *Perceiving, Acting, and Knowing. Towards an Ecological Psychology*, eds. Robert Shaw and John Bransford (Hoboken, NJ.: John Wiley and Sons, 1977), 127–143.

30 On this idea were founded many schools of thought of the twentieth century (see Silvano Tagliagambe, *Lo spazio intermedio*). However, while the starting point of those theories was generally a holistic one, implying the total fusion of the One with the All, in AR the relationship between man and the environment is much more problematic: it proposes an "imperfect" blending of the human subject with the surrounding context.

films. Through laser rays that produce the effect of multiple mirrors, the first projected images remind us of how inspiring the use of kaleidoscopes has been in the history of fashion. The projected images of the models, subjected to stop-motion techniques that translate their movements into sequences of freeze-frames, re-propose early reflections on the moving picture.[31] For instance, we see a frantic sequence of close-ups on the models' faces and Burberry products, which increases our awareness of all the things that can be done with cinematic images. At the same time citations from classical cinema can be detected, from De Sica's *Miracle in Milan* to *Mary Poppins* and even, with an abrupt leap, to Morgan Fisher. The references to cinema also entail a cinematic perception of the body: as in film, here, too, images are meant to preserve "human transience [...] the significance of fragile, fleeting feelings."[32] This representation of the body poignantly clashes with the physical appearance of the models on the catwalk, yet it seems to enhance their humanity.

The show also traces back the history of the visual arts in general, spanning from painting to video installations. Citations from famous artists and movements are numerous: from Futurism – in particular the stop-and-go effect given to the models' steps on the runway, which reminds us of Boccioni's sculptures and paintings – to Pop Art, Edward Hopper's paintings and, above all, Andy Warhol's serigraphs. The representation of the bodies of the models is also strongly inspired by digital art, to the point that we may confidently affirm with Ana Viseu that augmented bodies can be what the graphics says they are.[33]

The stress on the amphibious dimension of bodies is constantly felt. Once again, the reference to the permeable borderline between the underwater world of the web and a more aerial dimension is clearly perceived. Models are made to resemble jugglers suspended on a line, in precarious balance between the real and the virtual level. Emerging from the holographic sky, they paradoxically look very real. But the illusion will not last. Suddenly we realize that their bodies start to transform, taking the shape of the models they collide with; they can interpenetrate and exchange their features and clothes; they can even explode, evaporate into white or red clouds, be shattered into pieces, fall down like a

31 Cf. Henry Bergson, *Creative Evolution* (Lanham, MD: University Press of America, 1983).

32 Leo Braudy, *The World in a frame. What We See in Films* (Chicago: University of Chicago Press, 2002), 201.

33 Ana Viseu, "Augmented Bodies and Behaviour Bias Interfaces." Paper presented at the *26th meeting of the Society for Social Studies of Science* (4S), Milwaukee (November 7, 2010): 11, accessed September 3, 2014, http://fcis.oise.utoronto.ca/~aviseu.

shower of raindrops and finally dissolve into nothingness.[34] In short, augmented bodies seem to epitomize Gilles Deleuze's idea of human bodies as something that "cannot be discussed in terms of subjects, objects, beings but of planes, intensities, fluxes, becomings, alliances, linkages, and all sort of volatile junctures among them, alliances of intensities, movements, forces, energies, events."[35]

Broadly speaking, the augmented body epitomizes the idea of the wired body.[36] Thanks to tags and other systems of geolocalization, the body is permanently connected to the web, it can be tracked in space, pointed at, be made to communicate information even without its knowledge. AR devices can tell us whether a person walking in the street or living in a nearby house is a member of a particular social network. Human faces can be identified through pattern markers that measure their spatial coordinates and can either tell who you are or, at least, which gender you belong to. Motion-capture technology can seize human movements and gestures, reproduce them like an interactive mirror. Yet, the threads that tie up the human limbs to digital space are invisible or, at least, hardly noticeable.

In fashion we witness an extensive use of AR or QR tags, which can be applied either to clothes or directly to the skin. Sometimes the use is based on the awareness that the tag itself – even without being necessarily turned into virtual imagery – can be an interesting aesthetic element; sometimes it is the connecting property of the tag to be exploited for aesthetic reasons. This reminds us of the fact that the human body has always been considered as a carrier of messages – from ceremonial vestments to t-shirts covered with slogans and brands. Similarly, the skin has since antiquity been used as a writing surface, as in make-up, body painting and tattoos. With AR, clothes and skin can become the physical support for tags. And since the tags are algorithms encoding messages that can be decoded by digital cameras, with AR the body itself may be turned into an encrypted object ready to be deciphered.

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34 Besides proving the aforesaid permeability and liquidity of the body, this also shows another interesting possibility of AR, that of making the visible invisible. Indeed, although we tend to associate the augmentation with an addition of information, AR can also be used to eliminate objects from the visual field: the digital camera recognizes certain features and ignores them. See http://www.openthefuture.com/2008/08/making_the_visible_invisible.html (last access September 17, 2014).

35 Betti Marenko, Betti, *Body Marking/Body Mapping* (Urbino: Centro Stampa dell'Università di Urbino, 2001), 9.

36 Patrizia Calefato, *Mass Moda. Linguaggio e immaginario del corpo rivestito* (Roma: Meltemi Editore, 2007), 31–33.

The possibility of augmenting the body with the application of tags can lead to aesthetically powerful experiences. The effect can be really amazing, as we can deduce from the following description of an AR fashion show.

> Yep, clothing. I remember the first time I saw an AR outfit. I did a double-take, because I could have sworn that the woman had been wearing a fairly bland dress when I saw her at a distance, but suddenly she was wearing a sparkling gown that I could swear was made of diamonds. A few minutes later, I took off my arglasses to get something out of my eye, and *poof* her dress was back to the simple beige shift. That bland outfit was actually carrying a half-dozen or so specialised smart tags, providing abundant 3D data that my arglasses – and the AR systems of everyone else around her – translated into that diamond dress.[37]

The novelty of the performance, clearly stressed by the author of this description, undoubtedly raises important issues, particularly about the visionary, collective nature of the event. Yet, it also reminds us of the fact that the intent of fashion has always been that of producing amazement through a transfiguration of substances. As Yuniya Kawamura underlines, fashion has always had the function to turn plain clothing into a stunning experience.[38] Here is an account by Apollinaire, which, although written almost a century ago, seems to echo the previous quote.

> I have seen a young woman on the boulevard dress in tiny mirrors that are appliquéd to the fabric. In sunlight the effect was dazzling. It was like a walking gold mine. Later, it began to rain and the lady looked like a silver mine. [...] It [fashion] does for substances what the romantics did for words.[39]

The parallelism between fashion and rhetoric is clear. As Apollinaire suggests, fashion does to substances (fabrics, but also bodies) what figures of speech do to plain language. Indeed, since rhetorical strategies have often been described as clothes and ornaments, then, conversely, also clothes can stand for rhetorical strategies. If we shift back to the description in first quotation, we could remark that also the virtual imagery produced through AR technology may be considered as the visual equivalent of figures of speech. We could even go so far as to say that in Augmented Fashion, technology somehow challenges the traditional role played by fashion as rhetorical process.

Beside the aesthetic effect, also the playful side of the experience is emphasized. As we perceive from the above description of the model wearing tags on her plain dress, putting on and off the AR glasses to see what happens, transforms the event into a game of detection. Indeed AR involves a number of

37 See http://www.fastcompany.com/1568276/augmented-fashion-reality (last access May 31, 2014).
38 Kawamura, *Fashionology*, 85.
39 Wood, *The Surreal Body*, 9.

manipulative activities, such as scanning the world or waving the tag in front of the webcam. Thus the process by which the virtual information is made to appear follows the dynamics of an interactive entertainment. In a sense, wearable tags transform fashion objects (clothes, watches, suitcases, etc.) into portable gadgets and fashion into a locative game.[40]

The same effect can be obtained with AR or QR tattoos: here the three-dimensional imagery will seem to be produced by the body itself. No fabric or film separates the body from the virtual image protruding from it. These images "coming alive"[41] on the human skin used as a writing surface even seem to exemplify the idea of the grotesque body, constantly metamorphosizing into something else, with "things" (extra limbs, inside organs or other strange objects) coming out of it. [42] This procedure – the tagging of any writing surface – can also be used for other than innocent purposes. Blameless clouds and farmhouses can be substituted with more aggressive figures: from uncanny eagles, dragons and tigers to pornographic material. The peculiar feature of AR, the fact that information is encoded, and therefore invisible to the naked eye, allows these encryptions to be overtly shown in public. Therefore AR and QR codes can be used either to protect viewers from offensive contents[43] or to bypass censorship: [44] verbal messages, images, videos will be visible only to the owners of devices capable of decrypting the code. On the other hand, anyone in possession of such devices will be able to read the encoded information.

This raises many questions: is the fruition via smartphone or tablet to be considered as a private responsibility or is it to be controlled, lest minors, for instance, might reach it? Is it still possible to consider this kind of encryption

40 A company that produces children's wear has actually put on the market an AR tee-shirt you can play with: if you stand in front of the digital camera wearing it, the screen will turn into a magic mirror that reflects your own figure surrounded by 3-D imagery that seems to emerge from the tee-shirt itself. The video is available at: http://www.youtube.com/watch?v=nTKHeaaB03A (last access May 31, 2014).

41 See http://mashable.com/2010/02/17/augmented-reality-tattoo/ (last access May 31, 2014).

42 Cf. Roland Barthes, *L'empire des signes* (Paris: Skira, 1970). See also Calefato, *Mass Moda*.

43 Photographer Jeff Crawford, for instance, found a way to avoid censorship by displaying the encrypted version of his nude "Emersion" at the museum of Fredericton. See http://www.cbc.ca/news/canada/new-brunswick/artist-evades-nude-censorship-with-smartphone-1.1109037 (last access September 3, 2015).

44 Of course this is not the only way of using QR codes for criminal purposes. They are actually becoming a favourite tool for cybercriminals, because they can be replaced with malicious QR codes to install malware.

as a private experience, even when the QR code appears on an enormous billboard on the public road? Answers to this question have to be tentative. In the future, R-rated contents will probably be blocked by installing specific programs on children's mobile phones and tablets. Or, as an alternative, by including in the AR or QR tag pattern markers that can detect the physical characteristics of the person standing in front of it, thus telling whether it is an adult or a child.[45] However, it is difficult to deny that this kind of control would hardly be practicable. Besides, this scenario would be rather uncanny.

A significant example of the aesthetic and ludic potential of QR codes, but also of the ethical problems involved in their use, can be observed in the Calvin Klein billboard that appeared in Houston Road, New York in 2010. The claim reads: "Get It Uncensored!" What this advertisement does is to raise expectations about the contents that could be opened by decrypting the underlying QR tag which, placed as it is at the centre of the stage, is the undisputable protagonist of the ad. The pleasure of discovery that is inseparable from the action of browsing, acquires in the billboard a strongly voyeuristic twist. The tag is turned into a peephole that has to be made to fit into the rectangular screen of the handheld device and subsequently scanned. The display, by turn, changes into a sort of magic lantern that shows a 40-second commercial starring five models – Lara Stone, "A.J.," Sid Ellisdon, Grayson Vaughan and Eric Anderson – performing an erotic scene.[46] Both the font and the colour (red) suggest a forbidden experience. The magnified X, bottom right, recalls, at the same time, the graphics of a computer interface, namely the icon that allows users to close a web page, and the Internet symbol for pornographic web sites. The voyeuristic effect is reinforced by the presence of the two red curtains at the sides of the QR code, which clearly evoke a theatrical performance or a peepshow. Everything contributes to the effect of secrecy and transgression.

The case is interesting also for another reason. The body there is no longer visible, not even in part: what is left is only its encrypted version. This process can also be observed in several AR fashion magazines, in which models have totally been replaced by QR codes. The pages entirely consist of encrypted

45 A digital billboard has recently appeared in the London underground that could tell whether the person standing in front of it was a man or a woman, owing to facial detection software that measured the distance between the eyes, the size of the nose and chin.

46 The video is available at: http://www.youtube.com/watch?v=r32RNUiamiI (last access May 31, 2014).

bodies: AR tags ready to be deciphered by computers and transformed into three-dimensional digital entities walking on a virtual runway between page and screen.[47]

Yet this radical adoption of QR codes to replace the human figure altogether is still quite unpopular, even in the glamorous, cutting-edge world of fashion. Its effects may actually be rather dull, sometimes even a little farcical. As already remarked, for the time being we still prefer to consider AR a mixed experience entailing "a sophisticated form of visualisation that *layers* [virtual] information over the physical world."[48] In the pages of the *Vogue* issue of January 2012, for instance, the models were partly covered with messages which resembled tag texts. Though the background of the textual boxes was transparent, the superimposition of levels was evident. What used to be placed in the foreground, the model and her dress, had become a distant, blurred image hardly perceptible under an array of frames filled with written texts. Still, the picture made sense precisely in this game of disturbance and revelation, concealment and disclosure. The aesthetic dimension resulted from the real-time perception of overlapping visual stimuli and the wavering between different planes.

A comparison can be made between this kind of superimposition and the perception of double images. These were traditionally associated with dreams or even schizophrenia.[49] They were also connected with the theory of the quantum leap and the holographic idea of the world, according to which all visible objects and even human consciousness are part of the same phantasmal dimension.[50] Many artists, from Salvador Dalì to Georgia O'Keeffe, have created double images to suggest visual paradoxes and visionary experiences. Also cinema has extensively used superimposition to represent fantastic settings and

47 See https://www.youtube.com/watch?v=W7Tkx5qrww4 (last access September 16, 2015). See also *Grazia* first augmented reality issue, November 2010 available at http://transformedbyyou.blogspot.it/2010/03/grazia-launches-first-3d-augmented.html (last access May 31, 2014). An interesting issue is the comparison between the effect of this use of QR codes in magazines and cinema. As photographer Will Davidson claimed during an interview after making the AR video *Exhale* for the London Fashion Week in 2010, this kind of Augmented Fashion can be described as "a bridge between the printed magazine and the moving image world." See: http://www.jotta.com/article/v2-published/631/augmented-fashion-a-reality (last access May 31, 2014).

48 See http://www.openthefuture.com/2008/08/making_the_visible_invisible.html (last access September 17, 2015). My italics.

49 Michael Betancourt, "Paranoiac-Criticism, Salvador Dalí, Archibald and Superposition. Interpreting Double Images," *Consciousness, Literature and the Arts* 6.3 (2005), accessed September 18, 2015, https://blackboard.lincoln.ac.uk/bbcswebdav/users/dmeyerdinkgrafe/archive/betancourt.html

50 David Bohm, *Quantum Theory* (New York: Prentice Hall, 1951).

unrealistic situations. From Méliès to Marcel L'Herbier, double images have been so frequently exploited that André Bazin, commenting on the "falsely aesthetic oneirism" of these film directors, critically declared: "Superimposition on the screen signals: 'Attention: unreal world, imaginary characters.'"[51] Finally, also fashion, like art and cinema, has often resorted to superimposition to evoke a fantastic or dreamlike dimension. From kaleidoscopes to mirror-images, from multiple screens to AR, fashion has always tried to find ways of suggesting its ambiguous magic through double images.

The most amazing effects in fashion shows have lately been obtained with holograms. Suffice it to mention here Alexander McQueen's Fall Fashion Show of 2006, where the appearance of the hologram of model Kate Moss wearing a flowing white dress and freely revolving in air powerfully expressed all the impalpable mystery of a virtual presence superimposed on the real context. The audience is there, still visible behind the see-through body of the model fluctuating under a pyramid of light at the center of the hall. This fluctuating hologram seemed to epitomize the veiling and unveiling process which is inseparable from the handling of the body in fashion.[52] Above all, the image retained a sublimed vision of the body, an idea of perfection which somehow seemed to contrast with any other form of technologization of the human figure. Indeed, although AR and holograms have some aspects in common – they are based on the overlay of different images and on interference patterns[53] – they differ from both the technical and the aesthetic points of view. Holograms are projections of previously recorded images, they are the result of a selection, they do not "happen" in real time. Consequently, the holographic idea of the body may be said to clash with the far less idealized vision of the augmented body.

51 André Bazin, "The Life and Death of Superimposition," *Film-Philosophy Journal/Salon/Portal* 6.1 (2002), accessed September 3, 2015, http://www.film-philosophy.com/vol6-2002/n1bazin.

52 See https://www.youtube.com/watch?v=q-38BdFGAho (last access September 17, 2015).

53 "To make a hologram, the object to be photographed is first bathed in the light of a laser beam. Then a second laser beam is bounced off the reflected light of the first and the resulting interference pattern (the area where the two laser beams commingle) is captured on film. When the film is developed, it looks like a meaningless swirl of light and dark lines. But as soon as the developed film is illuminated by another laser beam, a three-dimensional image of the original object appears." David Talbot, *The Holographic Universe* (New York: Harper Collins, 1991), 20–21. Actually, different kinds of disturbance in the signal can be translated into more information. Procedural "noise" in particular, can create more realistic effects in the representation of the human body. See, for instance, Ken Perlin's *Noise machines*, which show how interference can be exploited to add more humanity in digitally created bodies, to make them "come alive." Available at: http://www.noisemachine.com/talk1/ (last access May 31, 2014).

> In the augmentation framework the physical is emphasized, not as the model to be followed, but as something that needs to be perfected. The human ceases to be the measure of all things, the entity that machines are designed to imitate. [...] the augmentation of the physical through the digital does not result in physical plus digital, but in a new entity with its own specificities. An augmented human being has a distinct reality, and this raises new issues regarding the place of the human body and self in its relation to technological artefacts.[54]

Though fully acknowledged, this idea of the body as something that needs to be perfected through technology is only partially accepted by the world of fashion. Founded as it is on an idealized view of the human figure, fashion may exploit the complex paradigm of AR only to a certain extent. It can certainly adopt it for both functional and rhetorical uses. It will also indulge in the engaging interplay between the real and the virtual world, lingering on an imaginary borderline. Still, particularly on "sacred" occasions such as the shows organized by or for the greatest fashion designers, AR is mainly used metaphorically or utterly replaced by much more fascinating visual effects: evanescent holograms that exalt the beauty of clothes. After all, in fashion's view only fashion itself can satisfy the human need "to be perfected." Bodies can be effectively augmented only by the artistry of *haute couture*.

Mara Logaldo

Mara Logaldo (PhD, English Studies) is tenured Research Fellow in English language and translation at IULM (International University of Languages and Media), Milan, where she teaches courses of British culture and English for Media Studies. Her research interests include rhetoric, media discourse, urban slang ("Only the immigrants can speak the Queen's English these days' but all kids have a Jamaican accent: overcompensation vs. urban slang in multiethnic London", in *From International to Local English – And Back Again*, eds. Roberta Facchinetti, David Crystal, Barbara Seidlhofler (Bern: Peter Lang): 115–144), language and law. She has published monographs on Henry James, on discourse analysis, on New Journalism and, more recently, on communication in the age of Augmented Reality (Augmented Linguistics (Milano: Arcipelago, 2012)). Among her recent publications, "On Crimes, Punishments, and Words. Legal and Language Issues in Cesare Beccaria's Works," in *Literature and Human Rights. The Law, the Language and the Limitations of Human Rights Discourse*, ed. Ian Ward (Berlin: Walter De Gruyter, 2015): 289–308. She has been a member of AIDEL since 2008.

54 Ana Viseu, "Simulation and Augmentation: Issues of Wearable Computers," accessed April 1, 2014, http://link.springer.com/article/10.1023%2FA%3A1024928320234.