The Error Aesthetic

The Opportunity to understand Systems via Fractures in Coding

The aesthetic of fault, failure, breaking off or breaking down is a diverse phenomenon pervading a multitude of areas in daily life, art in general and medial contemporary music in particular. In addition to its destructive element, an error always allows the opportunity to look behind the facade and to comprehend mechanisms in systems. As soon as a function is impaired or defect we learn more about the operations of the system–be it biology, psychology, informatics, or any other branch of science-and this holds especially true for medially conveyed, digital content. In a reality increasingly capitalising on digitally transported content this viewpoint gains growing social as well as artistic poignancy.
This article firstly explores the conception and connotation of error in general and then specifically, referring to the field of digital media. I will subsequently discuss resulting implications for the arts and give examples of how to harness their attributes. Finally, I will elaborate my motivation in approaching the principle of error and reflect upon how this subject is substantially influencing my own current pieces.

Error Types and Principles

By definition, the first property adhering to error is negative. It represents the deviation from a rule, an expectation, or from a forecast. We initially experience something as disappointing if it fails to function as expected or wished. In all disciplines, however, something is gained from mistakes, because we are able to shed new light on situations or processes and question them. Many experiences and findings are based on faults–they have been accepted (trial and error), calculated (experimental design), or occurred surprisingly (failure).
Perception of an error firstly shows us that we had an assumption about or prior knowledge of an event or a function. Only then can we locate a mistake. An assumption can be made deliberately as well as unconsciously; with unconscious expectation, in particular, the observation of an error results in a deeper understanding of the outset, because, in now recognising the mistake, unconscious knowledge is being reflected.
Not only existing assumptions can be disappointed because unforeseeable, behavioural patterns might come to light. In this way, a new category is disclosed or a building block, not previously visible, identified. Errors always destroy the black box (for example, in the computer program or theatre performance). In such cases, we learn about the underlying principle or the attributes of a system. This is especially true when an error occurs not globally but affects only a subdivision of a system. In medicine, for example, the functions of different brain regions could be classified after accidents revealed their respective malfunctions.

Causes of Error

If an error occurs, we perceive something that we should not actually experience: we look behind the façade intended for us (functionality) and recognise principles of structure and process.
The causes of error are many and varied: components or relevant information might be missing, parts might be defective, or procedures interrupted by outside interference.
Thus, partial errors-not leading to complete failure-hold the larger chance for gainful insight as they often localise faulty components. This allows observation of ontological structures or technical construction methods. It is no coincidence that that debugging(in the programming area) successively checks section by section (and module by module). In a sim-

ilar way, illnesses have helped us to understand which brain regions are necessary for language genesis and comprehension.
Partial failure does not always lead merely to partial disruption–an entire machine may succumb to one broken wheel, resulting in a standstill. In this, we may learn less about the operation of the component, but more about their relevance, their indispensability. If in doubt though, a positive conclusion is also possible here: recognition of a (technical, sociological, aesthetic, or political) function, subdivision, or group. Examples in social spheres include financial crisis, burn-outs, and strikes.
In addition to malfunctioning components, impaired interaction can cause an error. A rich spectrum of malfunctioning communication channels and corresponding problems can be found in technical and interpersonal mediation.

Analog and Digital Media

When focusing on technical mistakes and medial dysfunction, the complementary classes-comparable with the partial and comprehensive error of "analog" and “digital"-can be roughly observed. An analog system, and thus the fault occurring therein, is based on continuous-not discrete-representation. This results in interruptions being experienced as distortion or modulation rather than a contextual, stepwise-occurring jump. Over-saturated tapes or scratched vinyl records lead to successive changes of sound–a continuous change in the system. In extreme cases, cracks and ruptures can appear in analog, but normally steady alteration occurs, mostly caused by consistent coding of information. A disrupted analog radio signal will probably distort or fade and only abort in the extreme, but the digital world is often another way around: storage and representation are not analog, not translated 1:1. Hence, if the coding is too disrupted, complete collapse may occur more quickly. Automatic error correction, as in CD-Players, bridges this gap, tolerating some faults until they suddenly show very strong impairment or abruptly stop working. Compression and more compact coding of data is subsequently the Achilles’ heel of the digital system.
In music, the management of intentionally induced errors in sound storage and technical music equipment has become well established, resulting in a collective of genres such as Glitch, Noise, or Digital Noise, whilst this aesthetic has increasingly penetrated mainstream music, film, and other disciplines. Artists such as Yasunao Tone (born 1935) or the Oval music project (1991-96) have extensively drawn from these techniques in the digital world. Similarly, Martin Arnold (1959-) and Raphael Montanez Ortiz (1934-) have toyed with influences derived from manipulating video material. Bernhard Lang (1957-) has partially applied this model to composed works[1].
New sound-forms were thus created. The hard, screeching sound of a digital error was a welcome enhancement of tonal material: however, the textual and narrative layer of such edited source material is then also radically altered. The resulting jumps, splinters, and loops fundamentally change the chronology, dramaturgy, and perception of the piece. The outcome can be amusing, threatening, unsettling, or beautiful: yet it almost always means that we look differently at the source material and are forced to step back and view the content from a distance. These tools have understandably been established as popular remix instruments.

[1] Although this is a technical commentary: in my eyes, Lang illuminates and sometimes renders absurd mainly the conventions of musical language and execution.

Coding

In addition to musical and conceptual changes, these works always allow us to peer behind the backdrop of playback, storage, display or communication systems. The aforementioned „jumping“ CD with its inherent storing and scanning of music in blocks is the best-known example.
After CD-coding, the MP3-format is perhaps the most widely spread audio codec. This recognisably wasteful form of storage includes a (tolerated) flaw, which, depending on the grade of compression, becomes more pronounced or almost inaudible. In his piece “More than Half”(orig.“Mehr als die Hälfte“), Hannes Seidl had an orchestra play precisely those missing parts omitted by the algorithm for optimal storage. Every model and every approximation (deliberately or unwittingly) tolerates errors: Seidl steers our attention to these missing components, interpreting the absence of a barely audible but quantitatively significant element of the overall sound as a political metaphor for a system in which the majority of the votes are disregarded. A deliberately tolerated mistake is scrutinised.
A significant fault in digital video is caused by **virtual** storing of video images with reference to a keyframe. For example, only every 15th image is saved completely, while the following 14 images only record alterations. In this manner, the amount of data is considerably reduced without changing the image ratio. If the reference image is saved incorrectly or missing completely, subsequent images allude to an inaccuracy, resulting in a faulty, amorphous, and surreal depiction, in which backgrounds, faces, and objects are interwoven. Nicolas Provost adopted this aesthetic in“Long Live The New Flesh“(2009)by subjecting film sequences from David Cronenberg’s“Videodrome”(1983) to these morphing mistakes, further emphasising the original film’s theme, the fusion of body and technology.
In his classic “I am Sitting in a Room“ (1969), Alvin Lucier primarily highlights the characteristics of space, language, and audio technology, but also incorporates the amplification of error in recording and playback equipment. Loss of quality due to repeated copying from a source (for example, VHS-Tapes) is examined as the principle of „Generation Loss“ in numerous works[2]. Errors successively creep in, destabilise the image and distort the sound. In the digital equivalent “Video Room 1000,” a Youtube-user uploads a video, only to download it again after it has been embedded and re-coded by Youtube. He repeats this a thousand times, comparable with Lucier, making the coding errors audible and visible.

In his lecture performance “Cancellation Artefacts,” Dan Tramte (1985-) introduces a set of examples in which transformed and therefore erroneous material is transformed in reverse, resulting in the original source material plus the artefacts created by the editing process. This leads consequently to a quasi-digital footprint of the manipulations (and error artefacts)used.

Behind the Scenes

As mentioned above, from the moment the technologies involved emerged, working with manipulated and corrupted digital media immediately created multitudinous, unique art forms. In an increasingly virtual, editable, and media-based world, the glitch is no mere means of sound design but a tool to reveal and make a theme of the constructivist elements in our surroundings.
A retouching mishap or the exaggerated modification of a model with Photoshop becomes a symbol of the omnipresent manipulation of body images. A crashed ATM with a Windows error message reveals to us the fault-prone, often hackable operating system, recumbent

[2] VHS generation loss(https://youtu.be/mES3CHEnVyI)

beneath the reputable, clinically untouchable surface of the financial world. Economy's omnipotent facade shrinks symbolically into a fragile, personal computer.
David O'Reilly's video works are riddled with glitch and noise elements. The beginning of the somewhat tranquil, poetic video-loop "Black Lake" (2010) depicts a rendered, nocturnal lake scenario with birds. Graphical misrepresentation gradually infiltrates the scene and instead, we notice motion vectors and object lattices. Virtuality is shown to us explicitly, exposing, in this case, loneliness and emptiness matching the aesthetic of the previous section.

Post-Internet

Following the complete conquest of the internet and digital means of communication, post-internet concepts have arrived in the art world and are increasingly established as components of younger composition and art scenes. In this context too, error repeatedly appears as a driving force, inviting us to reconsider the interweaving of virtual and real worlds.
Faulty software not uncommonly leads coincidentally to artistically exciting results, which observation is applicable to almost all of the aforementioned examples. A much-discussed application was Apple's "Maps," being initially particularly artefact-heavy. Here, texture data and altitude information were often poorly assembled in the 3D view. The result was the creation of geometrically impossible, pseudo-realistic depictions of the earth's surface. Non-matching data sets are also more generally a typical source of digital error.
The tables are turned however by Helmut Smits in his work "Dead Pixels in Google Earth" (2008)in which a square of grass (each side measuring 82 cm) is burnt off, turning it black. Viewed in Google Maps from a hight of one kilometre this represents exactly one pixel. This work of landscape art simulates, in reality, a virtual error that, when recaptured through satellite photography, is indistinguishable from an actual pixel error.
In turn, faults in Google's navigation system cause countless cars to be incorrectly rerouted into remote forest dead ends whilst trying to avoid traffic jams. Like Lemmings, disorientated drivers are stranded at woodland footbridges, becoming the unwilling playthings of-at least here-an inconsequential and absurd error.

Virtual Systems and Expectations

The error theme plays a continuous role in my own compositions. As my works primarily deal with digital media and their representation, the form of fault always derives from computer-based coding.
The creation of a setting or scenario is most often the starting point of one of my works and can be scenic, gestural, musical, visual, or textual: but in all cases, it is realised and conveyed with the help of technology, programming, and digitally controlled visual contents. Something generally artificial and constructed lies within this process. This act of creation and the connection of differing content (via technology) is initially not mandatory, but arbitrary. My intention is consequently to construct a system of virtual character and to provoke corresponding expectations. Examples could be the technical coupling of gestures to sound events, the setting of a lecture, or the application of video playbacks.
In my sensor-based pieces "Weapon of Choice" (2009) and "Laplace Tiger" (2009), gestures are translated into sounds and light. Firstly, this setup created an expressive, improvisatory-controllable hybrid instrument; additionally, the technology was to function as an extension and expansion of the interpreter. "Point Ones" (2012), and even more so "Serious Smile" (2013-14) play with the interaction between a sensor-supported conductor and an ensemble. The indeterminacy of whether the ensemble or the electronics are playing,

and in which form the electronic settings can be freely assigned, becomes apparent at the end of the piece when the conductor's gestures only generate error messages and are implemented increasingly asynchronously. Technical and interactive levels of interplay are derailed. In this way, the utilisation of error underlines the setup's constructive nature.

Narrative Collapse

The pieces described above concentrate mainly on gestural interaction, technical control, and nonverbal conveyance of contents, playing with resulting expectancies.
A rupture in content is not necessarily tied to a technical mistake but can be triggered by one. Computer error is used to that end In my lecture performance "Star Me Kitten" (2015). The piece commences with the establishment of a more or less believable setting, a musicological lecture, in which the ensemble illustrates thematic content. A theory is introduced and a number of symbols are described and interpreted musically. This results in the creation of a somewhat cohesive setting, leading to the PowerPoint presentation crashing after a third of the piece. From now on, the point of view has shifted, in part glancing into the "interior" of the computer; in the rest of the piece, the musical and visual material consists predominantly of warning messages and error signals. Furthermore, the viewpoint repeatedly peers backstage, behind the lecture: the preparation of transparencies, Photoshop editing, veritable mountains of music exploding the notation program; and again and again, error reports from the beamer and programs in use. But the crash and corresponding change in perspective primarily happen in tandem and above all on a narrative level. From this point on, the symbols and interpretation units previously established are moved into another context and reset, to no longer correspond with a formal lecture. The crash of the program opens up a stream of consciousness and one looks behind the facade of the lecturers, into an emotional, parallel world existing backstage. In addition to its functions as switch and material, an error also functions as a post-modern tool for quick, contrasting editing techniques. Just as mistakes in everyday life can unintentionally reveal differing attributes, so too do they enable a quick jump to conflicting content. The behaviour of the dysfunctional computer is always erratic and surprising. In this case, it discloses subjects and emotions underneath the surface, as well as technical components.

I use a similar approach in "F1" (2016): a tardy musician hurries onstage, stumbles and falls flat on his face, lying there inanimately from then on. The mistake happens right at the beginning of the piece, thus breaking with the expectations of a classical music concert and establishing a unique setting from the start. Here too, the error is followed by a dark journey through a morbid realm of thought: of death, deceit, and loss.

Artificial Bodies and Performance Mechanisms

Following the sensor-based works, I continued addressing onstage physique and the gestures of performers, developing in "Sensate Focus" (2014) and "Scanners" (2013/16) the concept of synchronised choreography paired with light programming. In these works, the musicians are positioned on a completely dark stage and execute artificial gestures in addition to playing movements. The performer is spotlit for the duration of every action. In this way, short excerpts(or samples, if one prefers), were created, expressing part of the performance's continuity and physical presence in a video-clip or GIF-aesthetic. The person on stage is perceived as a visual sample and reduced to an impersonal transfer. In "Sensate Focus," increasingly mechanical motions lead to a vehement acceleration, unrealisable by human performers, ending in an equally impossible passage. In terms of tempo, the instrumentalists are brought to their limit, resulting in error, a gearbox overheating.

“Codec Error“(2017), this approach of utilising synchronised choreography and lighting is continued towards a preliminary culmination. The basic setting is the same, but the stage is used in all its depth: and all the spotlights are mobile, enabling illumination of any desired stage area. The two drummers and the bass player can consequently be floodlit by any light, at any position, providing them with the freedom to move around the stage to diverse instruments. This heightens my intention to represent a live situation as if it were a video. The Stop-Motion principle directs all changes of position onstage. The musicians move forward imperceptibly in stroboscopic light, thus evoking the impression of an inanimate object shifting in the dark; they appear dehumanised, resembling holograms. This sensation is enhanced by position changes, intensifying the discontinuity. In accordance with the work’s title, I attempt to code–explicitly to video-code–the musicians on stage.

The first error occurs after a third of the piece: performance gestures are now split into micro-loops, similar to a jumping CD or better, DVD; resembling a broken playback device trapped in a loop. The image of an incorrectly read video file is now to be more explicitly evoked. The clip-like rendering of the performers contains a playback-malfunction, leading to the dysfunctional representation of the people on stage. Lighting amplifies the effect in this passage: the lights change between the basic colours red, blue, and green in patterns. Every flash of light leads to an instant snapshot–and consequently, as in the video analogy, to the generation of a frame. Changing between blended Red-Blue-Green colours emulates a classic video error (and also video effect)–the principle of colour-channel-offset. Furthermore, at least three spotlights are pointed from (preferably) orthogonal angles at every musician at all times. If these lights illuminate the musicians in specific sequences, then the successive snapshots highlight the player from different angles. In total, for example, we see the performer’s back in red, then the left side in blue and finally a blue flash from the opposite direction. This is a way to emulate coding error in a video file and create the aesthetic of a broken video file by analog means, without the deployment of projection. In this way, impressions of jumping frames and faulty anatomical images are accrued, in the most abstract representation possible.

Precisely in the middle of the piece, the malfunction causes a form of system crash and the presentation format is inverted. This section begins with one and a half minute’s silence, and all following activity takes place on an evenly lit stage. The piece begins anew, not identically, but similar in its procedure. The bassist moves once again towards the audience–but this time everything is clearly visible. This crash has resulted essentially in a change of perspective. The beholder can now review and reassess events and setting from a different angle. Performance mechanisms are openly exposed and demystified. Markings and tablets on the stage floor, microphones on musicians’ wrists and concealed spotlights are now visible. The holographic black box and the ensuing sensory overload have collapsed. These conditions are exacerbated towards the end of the piece, when, after another crash, the click-track is heard through the auditorium’s loudspeakers, the track also containing the headphone instructions with which the musicians find their cues in the dark. The last part of the stylised virtual setting’s mystique is revealed.
Now, not only the focus of the whole setting changes but in particular the perception of the musicians. Their ultra-abstract portrayal in the first part of the piece hindered their identification as humans–depicting them more as human projections. In the second part of the piece, the audience watches the performers’ figures for a long time, acquiring a more personal, emphasised perspective. The focus springs from a digital representation to the actual individual. In correlation to the first act, the working light onstage is only turned off occasionally, the musicians then only spotlit in brief flashes. The original, normal observation of musicians on stage changes abruptly, like an error, the representation of the performers, revealing their digital images. otherwise invariably mistaken The disclosure of the click-

track and other methods of deception-an otherwise invariably mistaken move-allows the audience to look at the controlling apparatus of the work and in this, the piece attempts to draw a universal metaphor.

Forecast

The world around us is becoming increasingly virtual, artificial, and superficially perfect. Multimedia content is more present than ever before and art has the chance to contribute to the reflection upon this system. Never before has the use of multimedia in contemporary art been simpler and more self-evident than today. This harbours dangers of affirmation and unreflected acquisition. But at this juncture, spectacular sound effects and computer-intensive video editing have become mass products, as well-established as Helmut Lachenmann's performance techniques. When the novelty of technology wears off, its usage becomes the actual issue. Here then, within the context of contemporary music, the utensils of media art have finally become applicable as content instead of decoration: and their creative and reflective potential is not to be underestimated. Our habitat is one of constructivism: methods and conventions can be questioned and penetrated via superficial failure. Perfection, or rather flawlessness, is omnipresent-but perhaps should no longer be the (sole) goal of music in the arts.

This is where the concept of error can take hold, breaking with conventions and rupturing communications. The defect, as material, is exhausted–glitches as visual or tonal elements already being somewhat exploited; but as a tool, it is currently more justified than ever.

How can art manage to call attention to, expose and criticise deception, perfection, paternalism, suggestion, surveillance, and body image?

In a collapse, we see what surrounds us, what we demand from ourselves and how we let ourselves be deceived. Virtual and media-transmitted realities are increasingly established and propagated on every technical level, whilst authenticity is traded as (frequently manipulated) currency. On an emotional level, the appearance of an error causes immediate disappointment; on a media level, we additionally experience a literally analogous suspension of deception.

We are so enabled, to look behind the facade, to see the abysmal, the broken. Behind the abstract lies the emotional, behind powerful the fragile, behind perfection, the essence. Not uncommonly, faulty systems steer unaided into brick walls. In other incidents, artists, hackers, and activists can lend a helping hand.