Idea:

**Renaissance 2.0 – re-activating the decorum, appropriateness, as an evidence based design principle for the built environment**

Challange:

**Hyperlocality – virtual rooms "get real" for technically enhanced spacial orientation and imagination!**

Example:

**The Vignola TRACEr, a neuroscientifically based AI for analyzing and certifying culturally encoded emotions of architectural drafts.**

The future will look very different – and it has to, due to the already foreseeable catastrophes.
Wouldn't it be nice if the built environment of the future at least "feels" familiar?

**Enter TRACE research:**

The interdisciplinary research group TRACE (Transmission in Rhetorics, Arts and Cultural Evolution, www.trace-culturalevolution.com), of which I am a founding member, has been looking for traces of an co-evolution between men and his culture on neuronal level for over 15 years. As an imprinting factor we suggested for the European culture the design rules of the classic rhetorics, especially the decorum, which influenced the design of the artificial environment for several millennia.

The search was done with – now internationally published – neuroscientific experiments on architectural perception. The results of our experiments strengthens the thesis that the decorum is in charge of some orientational functions, that men co-evolves with his culture and that the understanding of the rules has already been embodied by the different ways of inheritance, symbolic, behaviouristic, epigenetic and genetic.

Remark: Our search leads in a similar direction like the now popular search for old and maybe forgotten indigenous urban planning (Spiegel online 13.4.2021), only that we search along the lines of ancient European culture technics. The finding of TRACE, the still functional perception of the decorum rules at all kind of design levels, can be used to improve the intercultural communication, establish better interfaces between technology and biology, our brain, and design architecture that corresponds with our subconscious, culturally triggered emotions.

To put it with Plato, we don't know what it takes to be beautiful but we can say what it takes to seem beautiful. It is the secret of the decorum (of our European cultural inheritance) the appropriateness of the resources used in relation to each other!

With the findings of TRACE the principle of evidence based design in architecture, like it is successfully practiced within the health department, can be stretched from the learning

about the perception of nature to the perception of culture, aka architecture itself and even other design objects. For example you are able to trigger familiarity effects by showing specific architectural shapes / ensembles.

TRACE found out that there is a kind of proprioception of architecture which implies a reaction towards ancient cultural practices, which are written down within rules of the classic rhetorics, especially the decorum rules.
Remark: The decorum rules do not have to interfere with human / architectural creativity! Further experiments from colleagues in Florence suggest strongly that you do not necessarily have to rely on antic design to trigger similar effects. Contemporary approaches with modern shapes etc. seem to go along well with these science based "emotion design" of TRACE.

The neuroscientific experiments about the perception of architectural ranking inside western culture indicate that specific architectural designs trigger specific emotional reactions. These emotional effects vary with the type of architecture and take place during a pre-conscious or you can say subconscious time window of perception.

So while scanning our built environment passing it, we might very well be primed with subconscious feelings regarding the cultural purpose of the architectural designs. And while you don't know about those feelings, they may be disturbing. It is important to know about these effects because they are connected to the cultural background people spawn from by epigenetic or even genetic predispositions developed over the last couple of decades and centuries.

If culturally imprinted perception effects from a far distant past have been carried into present times and are still effective in our subconscious, then it is not only possible to talk about archetypes as mentioned by Jung and Freud, then there is a truly archetypical design language aiming on some kind of cultural primal trust, too.

The results suggest a latent threat for intercultural communication, because the decorum influences the perception process by creating an emotional reaction during an unconscious time window. That influence can either be invalidated by rationality or it can unfold its emotional power subconsciously (without knowing about it).

Attention / Warning: There would be no problem if there was only one, universal culture on the European continent or even the planet but we are dealing with a plurality of cultural lines of Inheritance. For example: The execution of the TRACE experiments in Bejing had shown that asian test persons do not distinguish the stimuli-classes, which is an indication for the existence of unconscious culture relativism.
In ethnic diverse societies like Europe different groups of people could be living in an environment that feels subconsciously not appropriate (to their cultural evolutionary background). Because in such a society the cultural "glue", a unifying decorum, an

emotion guiding system of symbols can not ( can not any longer) connect/relate to every individual and supply subconscious cultural orientation, at least theoretically, neurophysiological interfering pulses can influence the trust into the social overall structure in negative ways.
If there is such thing like culture relativism on a subconscious level it should be exposed and "disarmed" or even better being brought to a good purposeful use. For example by developing designs that integrate different cultures in a positive and adequate way into an European civilization!

The idea to create a seemingly beautiful, inclusive and sustainable future for Europe lies within the experimentally enhanced Reconnaissance towards the unconscious components oft the decorum, especially in architecture and its subgenre "public interest design", as well as corresponding design suggestions. Thereby the appropriate application of means, for example architectural or verbal, within a reference system, stands in competition with todays popular immoderate use of everything. The perception of excessiveness can lead to cognitive dissonances, like frustration or lost of trust too. Not to speak about the consumption of resources and the production of emissions!
This counts although for the use of (or the belief in) digital technology because to often it is not in optimal harmony with our own "brain software" and its inheritance systems.
The evidence based design approach of TRACE, which regards design as a system of references that mutually relate to each other, aims at a return of the rhetoric concept of appropriateness and leads thereby creative actions back to ancient and early-modern principles.
In this way, at least in western societies, corresponding dispositions and predispositions can be addressed, which have positive influences on the effectiveness of design. It is based on new neuroscientific insights towards the human perception of culture and design and therefore truly a "human centered" approach to re-invent European culture from a far distance past and in that way a "Renaissance 2.0".

The re-activation of the decorum, the appropriateness, can although have a stabalizing effect on Europes society. Best before devastating forces use its unconscious might to their advantage.

Of course further research has to be done and we are at it right now. The implementation of the TRACE research results – and therefore the embodied decorum perception – to NEB projects seems to be a co-design as it is meant to be.
Together we can create evidence based designs for a built environment (including mobility) with purposes, like feeling secure, integrated and, being an idea / project meant for the whole of the European union, proud (?) of being a part of Europe.
By the way, by using mainly existing buildings, urban mining materials and green energy it is sustainable too.

So be brave and lets shape the future, not as culture warriors, but as civilization engineers!

Challange:
**Hyperlocality – virtual rooms "get real" for technically enhanced spacial orientation and imagination!**

"*COVID is the dress rehearsal for future crises*", Slavoj Žižek
Maybe we have to stay inside! Digitisation and distance learning are a must – but we should not lose our minds (and abilities) over it.

In front of a background of future catastrophes minimising emissions and energy waste caused by mobility behaviour seems to be an urgent task. When humans want to preserve the opportunities for people to meet simultaneously, this leads to the concept of hyper locality.
Hyperlocal architecture wants to show the possible benefits of connecting technology and biology through an interface that uses both, virtual and real architecture. The concept of hyper locality merges the virtual and the real space by super positioning each other. Both spheres are coupled by a common ground plan. The Interfaces are architectural "passage marker" that can be of physical or virtual nature.
The purpose of hyperlocal architecture is the enabling of interpersonal meets, visits to museums, theatres and other contemplative places without travelling long distances through a fragile environment. At the same time the combination of virtual and real architecture is a training program for the brain and imagination by stimulating embodied neurophysiological dispositions.
After the COVID-19 pandemic there will be – unfortunately – a lot of empty architectural space, which could be used to house the hyper locality technology.

Example: A new imaginary museum (stands for all kind of larger venues like hyperlocal theatres, universities, schools or contemplative places). Based on a "mallorquin" ground plan a museum superposition room can be constructed and placed inside any kind of abandoned building.
The museum consists of four rooms which are connected by doors, though that after entering this room complex, visitors are able to walk a circle along the rooms. The walls, which might be movable to adjust slightly to various ground plans to mimicking famous museums, are made of screen material, most likely LED walls like they are used for the "virtual sets"(Unreal engine of Epic Games), remember the "Holodeck" of Star Trek. Walking through these hyperlocal rooms the surrounding presented on the walls changes when the visitor leaves one room to enter another. This way the four rooms multiply to an endless array of rooms, which can simulate nearly everything.

A hyperlocal museum would be like the "imaginary museum" or "museum without walls" of André Malraux even without imagination one might say because all artwork can be shown on the virtual level of the superposition space. It is not only the reproduction of all artwork, it is the reproduction of all museums.

**Challenge / Problem:** Space superimposing developed according similar schematics as described above complicate the self-perception and the perception of the surrounding space (1).

U. Neisser, The Perceived self: Ecological and interpersonal sources of self-,knowledge, Cambridge Univ. Press, 1993,

**Innovation:** This restriction of orientation is compensated by architectural markers. These are the smallest architectural units, that could be captured: for example the reduction of the temple facade, Ädikula, which is called "templem" and an entrance, called "portem". With the set of architectural markers, the typicality of a building can be determined, following the hypothesis: the higher the typicality of buildings, the higher the "protection of loss of architectural orientation".
The architectural marker organize themselves through an hierarchized decorum system, that expresses the relevance of the architectural rooms through a high-ranking-low-ranking scale. Neurophysiological experiments from the research group TRACE, Transmission in Rhetorics, Arts and Cultural Evolution, found proof of a cultural proprioception effect, that is triggered by architectural markers. Based on the experimental experience of TRACE and using the Vignola-TRACEr, an AI tool for analysing architectural drafts, proprioception effects inside the hyperlocal spaces can be created, so that more cultural proprioception leads to more architectural orientation certainty. In VR, in our surrounding and in our minds and brains. Hyper locality enhances the transfer from experienced VR into the brain based imagination.

This way the physical level of the superposition space, the ground plan, the spacial experience, the pathways and entrances – the passage markers, do not only help to orientate in a virtual environment, it enhances the memorisation of the perceived exhibition and trains therefore the memory as well as the imagination!

The physical aspects of hyper locality strengthen the transfer of virtual, technological experience to neurophysical, biological memories. Memories that are needed to create new thoughts or like the neuroscientist Nancy Andreasen puts it, "We remember our future". While using digital technology it is important to train existing cognitive abilities. For that reason hyperlocal architecture uses high-tech in a way like it wants to get rid off it.

Remark: TRACE developed a rhetoric training program which is tested successfully at schools and Universities. Key to that program besides its rhetoric origin is a virtual course where architectural markers enhance the memorisation of content.
And it works well!

The concept of hyper locality can and should be applied to the solutions of urban, social and ecological challenges in the (digital) future.
TRACE and I, can connect with – and contribute our ideas, know-how and experimental findings to – architects and city planners to develop common ground plans for specific tasks which can be used universal for installing spaces / rooms ready for hyper locality.
The use of the concept of hyperlocal architecture might enhance memory, concentration and orientation, which would be perfect for distance-learning, as well as it will help to reduce emissions by reducing traveling.
The implementation of hyperlocality into NEB projects seems to be a real co-design process Europe might benefit from while others rely on virtuality only!
By using mainly existing buildings and green energy it is sustainable too.

Of course further research can and should be done. Actually we are executing and planning new experiments.
Derived form the TRACE research has already the "Vignola-TRACEr", an AI-tool to predict the viewers emotional reaction to architectural drafts. This software, developed by the "Automatisierter Analyse-Service Rainer Gabriel und Jörg Wohlgemuth GbR", could be used to identify and determine the look (and feel) of the architectural passage markers.

Example:
**The Vignola TRACEr, a neuroscientifically based AI for analyzing and certifying culturally encoded emotions of architectural drafts.**

Without knowing, the great Rem Koolhaas described what we are up to when he answered a question regarding the possibilities of technology to slove all the rising problems (architecturally I assume, he was interviewed at the opening of his Countryside show in NYC)

*“It’s about the combination of extreme technology and ancient thinking. So it's not so much a statement that the technology itself will get us out of this mess, but rather that very specific tools are needed that have some potential. “*

Rem Koolhaas, Monopol Magazine, April 2020, No. 4, p.38

…and that is exactly what we are up to!
We are combining relatively extreme technology, an AI for pattern recognition, with ancient thinking, the rules of ancient rhetorics, which is not only the art of speaking but a

whole rule system for designing everything from a speech to architectural ornamentation for the sake of a specific emotional reaction from the public / audience.
And these rules shaped the western architecture for approximately 3000 years. Looking at the contemporary theory of heredity and the impact that culture might have on our evolution it is kind of a save bet, that the shape of the rhetoric rules must have had some kind of influence on the involved inheritance systems.

Enter TRACE research and the Vignola TRACEr:

The research group TRACE, Transmission in Rhetorics, Arts and Cultural Evolution, of which I am a founding member, is looking for neuroscientific proof of cultural evolution since 2003. As an imprinting factor we suggested for the European culture the design rules of the classic rhetorics, especially the decorum, which influenced the design of the artificial environment for several millennia. The group consists of cultural theorists, artists, designers and - of course - neuroscientists. A truly interdisciplinary group of people, bound by interest and curiosity, not money or funding. Our search leads in a similar direction like the now popular search for old and maybe forgotten indigenous urban planning (Spiegel online 13.4.2021), only that we search along the lines of ancient European culture technics. The search was done with – now internationally published – neuroscientific experiments on architectural perception. The results of our experiments strengthen the thesis that the decorum is in charge of some orientational functions, that men co-evolves with his culture and that the understanding of the rules has already been embodied by the different ways of inheritance, symbolic, behaviouristic, epigenetic and genetic. The ongoing research is respected well around the globe and new experiments with our old stimuli take place in China right now. But it is not only the kind of spirit of the TRACE members I want to give as an example for Europe.

Derived form the TRACE research has the "Vignola-TRACEr", an AI-tool to predict the viewers emotional reaction to architectural drafts. A software, developed by the Start-up "Automatisierter Analyse-Service Rainer Gabriel und Jörg Wohlgemuth GbR", that will hit the market as a cloud based web-service in Q3 of 2021.

The ingredients of the Vignola TRACEr pattern recognition software are:
- the input, outcome and learnings from the TRACE experiments
- rhetoric rules (like the ones written down by Alberti and in the „Vignola“)
- scientific studies (for example about proportions and color)
- lots of stimuli drawings

For the stimuli needed, a design-matrix was created and then I sat down to draw a few hundreds of architectural drafts that can be split into two groups to test high ranking buildings  against low ranking buildings. The task for the participants was to differentiate buildings from everyday items. You can find the results and more details here:

Oppenheim I, Vannucci M, Mühlmann H, Gabriel R, Jokeit H, Kurthen M, Krämer G, Grunwald Th (2010) Hippocampal contributions to the processing of architectural ranking. Neuroimage 50

The stimuli of our TRACE experiments are the backbone of the Vignola TRACEr pattern recognition software. By digitalising our design-matrix architects will be able to upload their draft into the phase-space where it will be located in the neighbourhood of the most similar patterns. That position will allow the system to allocate the draft to a certain, tested cluster of architectural models which indicates the emotional reactions connected to it.

With the Vignola TRACEr software, evidence-based "emotion design" is moving into architectural offices. The Vignola TRACEr analyzes and evaluates architectural designs with regard to the emotions triggered in the viewer (cultural-evolutionary). This allows:
a) Design optimization: The evaluation by the Vignola TRACEr can be used in the design phase to design a targeted emotional effect into the design.
b) Certification: The result of the analysis can be issued in the form of a certificate that shows the design its respective emotional quality. For example, by certifying that the building is "cultural heritage approved" or a "novelty sensation", corresponds to the identity of the location and triggers cultural familiarity effects or is suitable as an eye-catcher and arouses curiosity.

Remark: The decorum rules do not have to interfere with human / architectural creativity! Further experiments from colleagues in Florence suggest strongly that you do not necessarily have to rely on antic design to trigger similar effects. Contemporary approaches with modern shapes etc. seem to go along well with the science based "emotion design" of TRACE.

The purpose of the Vignola TRACEr is the prediction of emotional reactions towards architecture.
It should enable architects, based on scientific evidences, to create facades that are:
- more memorable – connecting to early model selection…
- more recognisable – …and the episodical memory
- sustainable – e.g. „new stuff gets old, familiarity stays fresh“
- better to differentiate – by affecting a preconscious feeling
- aware of the tipping point of a buildings character*

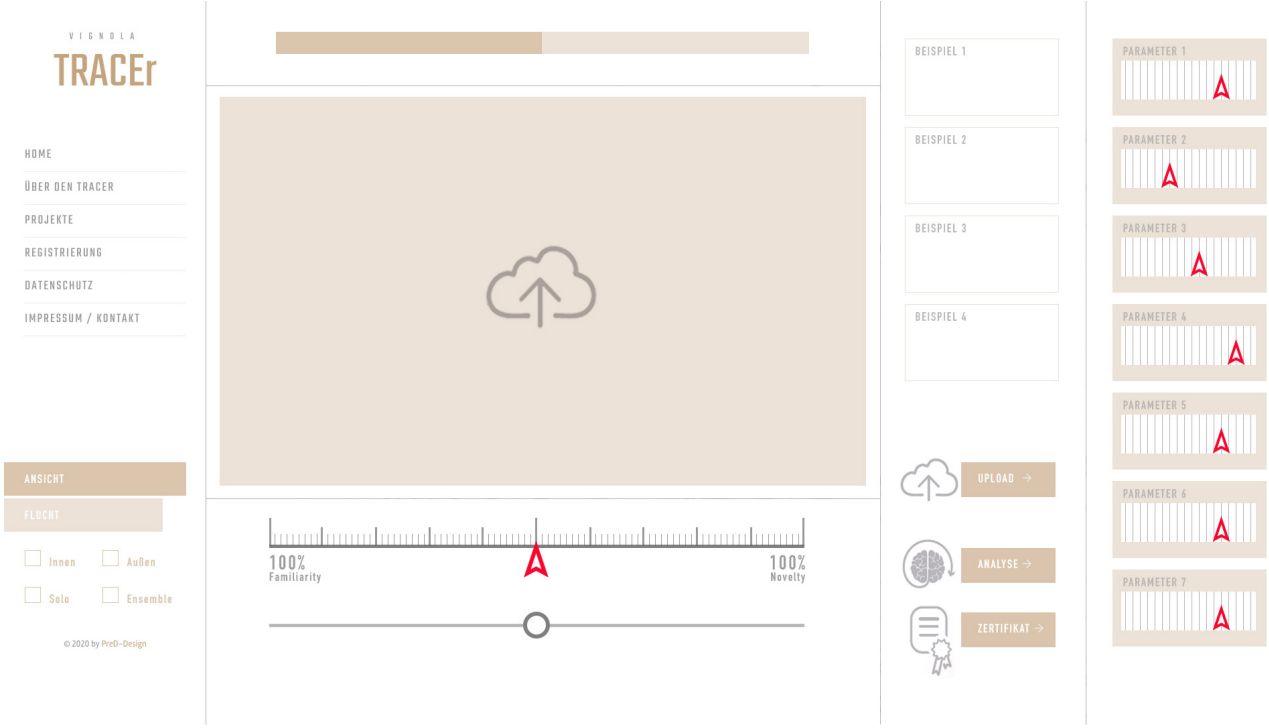
For example: A lot of new building complexes in my hometown look like some kind of historicized, heavily ornamented houses. That is very popular in Germany and Europe right now. Yes, the good old Times.
I was told that these buildings were very expensive and that they don't sell as well as expected. Assuming that the buildings are ornamented for the reason to create a certain feeling on their viewers, they might have tested the tipping point of that wanted emotional

reaction with the TRACEr to determine how much ornamentation is needed to create the effect and how much is money thrown out of the window!

The Vignola TRACEr will help architects and city planners to address genetic dispositions and predispositions related to shapes, forms and designs in general.
You may call this Humbug and maybe everybody in evolution theory is wrong but the assumption of addressing the Neanderthaler inside of us are already very successful. Just look at all the hospitals! It is evidence based design that the buildings windows face green vegetation. That is because a lot of studies showed that sight of nature actively supports the healing process of the patient. The same applies to indoor fountains.
It is all about dispositions and predispositions. The success of the coffee to go? We like to hold something warm in our hands (preferably bodies but a coffee is fine too) and while our stone age ancestors had to look for sweet stuff to eat because of the energy sugar provides, we just don't stop eating sweets to get diabetes.

The first functional Vignola TRACEr should be available by Autum 2021. Right now the testing has started. Further research should flow into the constant development of the TRACEr to expand its analysing abilities.
But already from the beginning the Vignola TRACEr could be a tool with the ability to support the development and design of NEB projects that may look new but feel familiar, inclusive and beautiful. The TRACE know-how can contribute to almost everything.

To put it with Plato, we don't know what it takes to be beautiful but we can say what it takes to seem beautiful.




*Pic.: Vignola TRACEr UI (work in progress)*

Feel free to contact us / me! Your are very welcome:

TRACE Transmission in Rhetorics, Arts and Cultural Evolution
% Dr. Rainer Gabriel
Friedrichstraße 107
D-40217 Düsseldorf
Germany

Mobil:
+49 (0) 179 797 5468
Mail:
info@trace-culturalevolution.com
rainer_gabriel@web.de / rgabriel@pred-design.de

Info:
www.trace-culturalevolution.com (only in German at this point, please use a translation offer like www.deepl.com to translate specific topics of your interest)

https://vignola-tracer.com/ (only in German at this point, please use a translation offer like www.deepl.com to translate specific topics of your interest)

https://fk8.uni-wuppertal.de/de/forschung-und-design-sammlung/forschungsgruppe-kulturtransmission-trace.html (only in German, please use a translation offer like www.deepl.com to translate specific topics of your interest)

TRACE papers:

Oppenheim, I., Mühlmann, H., Blechinger, G., Mothersil, W., Hilfiker, P., Jokeit, H., Kurthen, M., Grunwald, Th., (2009) Brain electrical responses to high- and low-ranking buildings, Clinical EEG and Neuroscience, 40, 157-161

Oppenheim, I., Vannucci, M., Mühlmann, H., Gabriel, R., Jokeit, H., Kurthen, M., Krämer, G., Grunwald, Th., (2010) Hippocampal contributions to the processing of architectural ranking, Neuroimage, 50,742-752

Mecklinger, A., Kriukowa, O., Mühlmann, H., Grunwald, Th., (2014) Cross-cultural differences in processing of architectural ranking: Evidence from an event-related potential study, Cognitive Neuroscience, 5.1, 45-52