

Transcript of the interview conducted by César Cantú Hernández in August 2017 for the article "CAEDMON: A MACHINE THAT DREAMS OF PAINTING" published on thenews.mx website

LINK: <http://www.thenews.mx/world/caedmon-a-machine-that-dreams-of-painting/>

**So, I read on your site that you started liking computers since you were about 8. How did that first encounter with computers happen?**

My uncle gave us his old computer, a win 95 machine with 4gb of hard disk. I remember the first software I saw was Photoshop, or Corel. My father was playing with it. I was apparently too young to get allowed to use that wonderful, magic thing... But I was already in love with it... So I build my own computer with a cardboard box and an old typewriter. It took years before I was allowed to play with the real computer

**How long did it take? To get your hands on the real computer, I mean**

One year, maybe more. I was mostly playing around with photoshop and stuff like that, I was 13 when I started coding

**Did you learn to code by yourself?**

Yes, with a book my uncle gave me. My first programming language was visual basic 6. I was creating small games in the beginning. Next, few years later, in high schools, where I studied programming, the professor gave us a lesson about how to make vb draw shapes and things like that, and I spent the greatest part of my high schools creating small softwares which drew automatically. In the meanwhile Internet started to be popular and I started to learn html and CSS by myself and creating small websites. The natural outcome of this was learning php, a language used to develop web applications, and mysql. I was 18. Php is barely considered a serious programming language, but Caedmon's is written with it.

**That's odd. Why is PHP not considered serious amongst programmers? How is this "seriousness" defined?**

It depends, it's mostly about types... Like, in Java when you declare a variable as a number it can not become a string (a word, for exam-

ple). Apparently it is something very nice for some developers. I hate it. In php everything can be everything, it gives you a lot of freedom, it even allows you to write extremely shitty code. It's a matter of freedom, and that's what I love. For me coding is more a matter of creativity than pure logic. So basically I wrote caedmon in php to demonstrate to some of my colleagues that you can do wonderful things even with a language that they would consider shit

**Explain to me this idea of coding as creative act instead of a matter of pure logic. What do you mean by it?**

When you start coding, you are alone in front of a white page. It's up to you then what your words will be able to create. It's not so different from the job of a painter, or of a writer. It's a matter of creation. It's just you and the white page, and at a certain point the things you are writing suddenly makes sense, becomes alive. It's a sort of a fight, a match against the machine but also a symbiosis with it, a kind of dance. Carving out from words something which, differently from a paint or a book, is almost alive, exist in the time other than in the space, and with which people can interact. It's like creating a new life with just your words. Isn't it a matter of creation?

**That's quite interesting. Have your creations ever done something that surprise you in a way? And also, what do you consider to be your place in this process? With Caedmon, for example, who's the artist? You or Caedmon?**

Computers are supposed to do exactly what you tell them to do, so if you want something surprising, or unexpected, you have to code it that way. In fact, making caedmon unpredictable in its results has been one of the biggest challenges. And, I have to say, some of its results are extremely interesting to me. Apart this, in my career as a developer I saw many many bugs, as it is normal to happen. Most

of the times they are just errors you need to solve, but sometimes they are funny, and even interesting. For example, many years ago - I was still working in Italy as a freelance web developer - I wrote a small software which was supposed to resize some jpeg files, but due to a bug it was saving corrupted files which were very glitched, and super interesting. It has been the core of one of my first computer art projects, working with the idea of 'digital recycle'

About the second question... First of all, and this is the core of the Caedmon's project, it's difficult to determine what is art and what is not, so it's even more difficult to decide who is an artist and who is not. So, the following is just my opinion on the subject. I consider Caedmon a piece of conceptual art. Caedmon is there and its (his?) role is to let people think, it's to pose questions. I've always been interested in the conceptual part of the art, more than in the prettiness of the result, or its attitude to decorate the living room of some collector. Not that I see something wrong in the art dealing, anyhow. So, caedmon is my opera, because I created him and gave him a meaning, a concept. But, also, Caedmon is something alive. I don't have any control on what he does, on what he creates. He is somehow alive, he does basically whatever he wants. My role was to create him, but now he is free to pursue his research. I'm just a spectator, as you are. I like to think about my relationship with caedmon as the relation between a father and his children. I made him, I tried very hard to give him all the tools and the knowledge he needs in his life, and now I look at him and I'm proud of him and of what he does. I've never been interested in creating visual art, as I said, so I can not really consider myself a good judge for what concerns visual art, but I have to admit I find some of caedmon's creations, and again this is only my personal opinion, way more interesting of many things I saw my colleagues in art academy painting over my student years

**I've seen you use the word "research" in Caedmon's page a couple of times when referring to its artistic growth. Do you see artistic development as a form of research and data analysis, or is the use of the word some sort of happy accident?**

Research, in art, is extremely important. I personally don't believe the myth of the self-taught genius. This may depend by my academic formation, but I strongly believe that coherence, in the art, it's very important. There is not true innovation if you ignore what happened before you. Creativity for the sake of being creative is a pretty sterile exercise. If you look at any art history book you can see that all the art that is there - art which survived its own times - is clearly derivate both from what happened before in the art field, both from what happened in the society before and during an art trend. Then the reaction may be a total negation, a rupture, as happened with the dada for example. But even if you want to rebel against something, there still is that something that you need to study, research and understand if you want to go against it

**Do you consider yourself, or even Caedmon, in a way, a follower or inheritor of certain tradition within art's history?**

The whole idea of computer-generated art, in my opinion, has its roots in dada and in the surrealism, as those movements firstly hypothesised an art created with the lesser human intervention as possible. Also, the futurism, with its boundless trust in the power of the machine, and the pop art with its fascination for a kind of mass produced art, might be identified as potential inspirations for Caedmon. Of course, though, it's not that when you have an idea you start thinking "I want to do something inspired by X, Y and Z". You have the idea and, a posteriori, you realise what might have inspired you to get that idea. Also, as I said, my passion for computer generated art is even antecedent to my art studies. It's just that, at the time, I had no idea about what I was doing. Then, studying other points of view, and all the art which existed before me, I was able to grab some ideas here and there to improve my work, but again this is not something planned. It's just that you start having better ideas.

**Explain to me these fascination you've had with computers since your youth. What makes them so special to you?**

It's hard to explain, some people loves RC planes, others loves cooking, I love computers. There may be some reasons... Every time

you code it's a challenge between you and a machine, for example, which is very entertaining. Also, there is the creativity aspect, as computers allows you to do much more than painting or writing, for example. But, apart rational aspects, I'd say it's something that just happened.

### **I also read you were into games as a child ; your game station story. Are you still into videogames?**

Videogames had had a very important influence on my decision to start coding, actually, but then I became more interested in creating them than playing with them. I still have a NES clone at home, though, for some sporadic Bomberman or Mario afternoons.

### **How did they influence you into the world of coding?**

As a kid I was fascinated by those games, and as I've always been curious I wanted to know how they were done. Of course I couldn't imagine it would have been so complicated, back then

### **Do you remember the concept you had of programming back then, as a kid? The ways in which you conceived the idea of coding and its possibilities.**

I did not really any idea of what programming was about actually. I just installed the visual basic and started reading the manual. I was pretty disappointed actually when I understood that it was actually going to be complicated. Still, it was something almost magic, even if the maximum that I managed to achieve those first days was to change the label of a button, and stuff like that.

### **So, you told me one of your first computer experiences was looking at either Corel or Photoshop. Was that your first contact with digital art, or when did you stumble upon this idea of art through computers?**

It was actually my first contact with computer graphic, way before than I started programming (actually even way before than I was allowed to use a computer, as I said). Computer graphic has always been something very interesting for me, it's mostly because of that I studied graphic design in my aca-

demy. Computer art and computer graphic, though, are for me two different things, very different indeed. Using Photoshop and creating something which we then define art has nothing to do with computer art, computers in this case are just a tool. Computer art, instead, is art generated by a computer, or at least where the machine is something more than a mere substitute for a brush. Reducing computer art to Photoshop is, well, reductive. For what concerns me, as I said, the first time I discovered that a computer could create art by itself was in high schools, when a professor gave us a lesson about how to draw shapes in visual basic. I started experimenting with this, and tried to automate the process somehow. Those were very first attempts in this direction, something which I never even thought about consider as art. Also, my intervention in them was huge as, as I said before, it's very hard to make the computer create something by itself. Also, at the time I was not even interested in art. I thought those shapes generated and animated by a software were cool, and that's it

### **When did you start to have an interest for art?**

It happened pretty late in my life. As I said, I went to the academy of fine arts just because they had a course in graphic design and I hated math enough not to get enrolled in a software engineering faculty (where they have a lot of math). Art was not something interesting me, especially contemporary art. Then, thanks to the academy, and thanks to some wonderful professors, I got passionate about it and it came natural to me to mix those things I liked: computers, graphic design, and art.

### **What called your attention at first? The classics and those kind of things, or did you picked an interest for more modern things?**

I think classics are what people appreciate the most as they begin to approach arts. Figurative artworks are immediate, and easy to understand. In fact, this being overexplicative has been the core business of art for centuries - think for example about mediaeval frescoes. Conversely, contemporary art is more cryptic (often on purpose), and it has more level of complexity beyond the pure shape-color-figure. In fact, since the beginning of the last century, and since Duchamp particular-

ly, we can consider almost everything as art, and the most contemporary art is far from the representation, the more complex it is to understand, and, because of that, relatively less people can understand it compared to a mediaeval fresco, to go back to my previous example. As I said, often contemporary art requires the observer to know a little bit what happened in the society and in art history before and in the meantime than the opera was created, in order to be fully understood. That is what I like of contemporary art, and the reason I prefer it to classics. There is nothing with figurative though, as it also was justified by its own times, but those who still do figurative paintings nowadays, I can not really understand why they do it.

**Let's talk about Caedmon. So, how and when did the concept of self-learning artist/computer came to you?**

A computer capable to generate art has always been the main topic of my research. As I said, my first approaches were more based on randomness than true learning. Basically I gave to the computer many small instructions to apply effects or elements over an image, and the computer then applied those in a random order. After many concept versions, this eventually become "sketchbook", a project which earned me the award "premio nazionale delle arti 2013" awarded by the italiano ministry of culture in a national competition between art academies' students. This random approach, though, left me pretty unsatisfied as the human role in this was too high, at the end it was me writing all those effects and so on, and the computer just applied them with no real understanding of what was going on. The question, how to really let a computer generate art, stayed in background in my mind for a while until, the following year, I came up with the idea of using the same approach natural evolution uses, in order to let the computer generate art. This was achieved letting the computer use and combine random functions to generate small images. Then, according to the likes the image got, it was starting to mix the processes it used to create a certain pair of high liked pictures to generate a third, child picture. This is basically the same concept on which caedmon works, but it took four more years to get the idea of letting the machine extrapolate a kind of 'dna' from already exist-

ing artworks and recombine those information to create something new.

**Are you satisfied with how Caedmon turned out? Do you feel you've reached your goal?**

I'm very satisfied with caedmon's results, and apparently people likes it, which is very rewarding. But, even if for the time being I'm fine with it, in a couple of years I may get another idea which will change everything again, who knows. Technology constantly evolves, and as new tools emerges, things which today we can only dream about becomes normal

**Ok, explain to me how Caedmon works. I understand you that at first you fed him thousands of images that he would analyze, but I don't understand what happens next**

Caedmon was fed with a huge amount of artworks from different areas and era. What he is doing is, for each image generated, extracting somehow the statistical structure, the 'dna' as I like to define it, of two of those pictures from the dataset, and combining those information to create a new picture. After that a picture in the training dataset gave birth to some images, it 'dies', being deleted, while those new images created enters in the training dataset. then, after some time, those pictures, which were posted on various social media, gets evaluated. If a picture got an higher-than-average number of likes, it stays in the dataset, else it gets deleted. So, over time, we know that only pictures with features able to be liked by people, will stay in the dataset and will then be able to give birth to new pictures. That's why I define this as closely related to natural selection

**Let me see if I understood some details. After being used to create a certain amount of new artworks the picture is never used again? If he uses a portrait by Picasso to combine with other images, will it stop using it after a while, after exhausting all possible pairings?**

In principle, a picture in the training set will be paired with five other random pictures before it gets removed. Those five pictures might be part of the training set, or other pictures already created by Caedmon. Also, if a

training picture was used to create some images which got a very high number of likes, it will be allowed to create more children before Caedmon stops to use it. Anyhow, parts of the original training picture's 'dna' survives in its children, which, if liked, will have then other children, and so on

**You mentioned people have shown a liking for human features in Caedmon's work. What other traits have people judged worthy of reproduction?**

Actually I couldn't see any preference for human features. The trend I could observe is a predilection for artworks deriving from abstract artworks, but this might be due to the fact that Caedmon's algorithm works better with those images compared to figurative ones as abstract paintings are, actually, easier to 'abstract', and therefore Caedmon can better extract a pattern from them. Also, those works tends to be more colourful, which is something people likes

**Will you let Caedmon continue doing his work indefinitely or do you plan to end the project at some point?**

Eventually, the process will lead to a single image which will somehow be the sum of everything Caedmon learnt during the process. It will take years, though.

**And when Caedmon reaches that definitive artwork, what's next?**

I hope I'll have a new good idea until then

**Great. So, on your page you state that you're not an artist, but an accountant. What do you mean by that?**

I never felt being an 'artist'. There is a sort of mythology around this figure, with which I don't go well. Also, in high school I studied business accounting (mostly because it was the only high school offering computer programming courses), and this is funny because those two figures are, somehow, antithetical

**What's this mythology of the artist and how does it bother you?**

There is this idea of the artist as a undisciplined genius, driven by intuition. Intuition is

important, as well as creativity, but a constant research and a strong discipline in the creation process are very important as well. This chiseling work, though, does not come out in the general acknowledgement of what 'being an artist' means. It's not just smoking pot and throwing some paint on a canvas.

**In a way, that's why you find conceptual artwork attractive?**

Mostly, yes

**Fear of automatization has been on the rise lately, except on the realm of the Arts. People believe creativity is an inherently human thing that no machine, no matter how advanced, would achieve. Do you expect, or even hope machines will break that barrier and become creative entities?**

Why not? Art is not an exclusively human thing, there are birds and fishes which have behaviour pretty similar to what we would call 'making art'. Also, the most frequent objection to machine making art is that computers don't have feelings, but a great part of the avant-gardes' research in the last century revolved around the opportunity to remove, or strictly limit, the part human feelings plays in the creation of a work of art. In this framework, is not unbelievable that computers will be able to create art. Of course this does not mean that the whole art world will be automatic in the future... Photography is around since many many decades and there are still people painting portraits and landscapes in a photorealistic way, and other people buying those works.

**What do you imagine this scenario would look like? Machines becoming "entities" of their own, becoming a part of artistic dialogue on their own? Programmers like you creating artists, becoming "artist creators"? The human arts finding a new path in the wake of automatization?**

I don't have an answer for this question yet. We are assisting in this years to the very first experiments in this field. It's just too early to draw a picture of what the future will look like, especially in an unpredictable field as art. It's important to start, though. To acknowledge that computers may create art. To start questioning ourselves on this matter. Caedmon,

in a very small way, it's my attempt to 'cast the first stone', without any further ambition

**Let's get back to Caedmon for a moment. What sort of images make up its training data set?**

Caedmon training dataset is composed by around 10000 digitalised versions of various work of art. The dataset is made in such a way to be as wide as possible, ranging between many epochs and cultures, with a focus on the art avant-gardes of last century

**That's quite a collection. How did you choose the artworks that make up the set?**

They had to be relevant artworks, something which the people would incontrovertibly recognize as art

**It took quite a long time, I suppose.**

It was a pretty time consuming part, but it had to be done. The whole project took almost six months to be ready

**Is there a logic behind Caedmon's combinations, or are they random, at least to an extent?**

The pairing happens on a random basis, but pictures with a high number of likes gets paired more often

**T.S. Eliot had this idea of the poet as an impersonal artist, but by that he meant that poets were mediums for a message, delivered by a messenger that transcended humanity. I guess the notion of "impersonal art" you referred to is different. If it is, could you explain it to me?**

The research of an art which could be totally impersonal has its roots in the dada movement and, then, in the surrealism. It's not a platonic concept, the research of something pure and absolute, it's more - but this is only my opinion - a matter of freedom. The artist, removing as much as possible his own influence in the artwork, does not impose a meaning or a feeling to the viewer, which is then free to give to the artwork the meaning he prefers. It goes back to the idea that an opera should not give answers but questions. While the search for an impersonal art had its best expressions in

dada and surrealism, other avant-gardes shared the same idea. Think about the cubism, whose aim was to represent the reality in its entirety in almost a scientific way, up to the point to introduce real-world objects and materials in their paintings. Also, the cubism influenced pretty much everything came after it. Or, perhaps, the minimalism, whose research was moving through a totally impersonal, factory-made art. Even the pop art can, up to some degree, represent an art which is pretty much impersonal. The best definition of impersonal art, though, is the one gave by Duchamp: *"You have to approach something with an indifference, as if you had no aesthetic emotion. The choice of readymades is always based on visual indifference and, at the same time, on the total absence of good or bad taste."*

This agnosticism is pretty impossible to achieve for an human being, who came packed with feelings and cultural constructs. Only the machine, which starts its journey in a truly neutral state, can achieve that

**So you're talking about a form of art fully abstracted from reality? Forms, colors and textures instead of emotions and concepts?**

There is nothing bad about reality. If you think about Duchamp's ready made, for example, they are the apotheosis of the reality which breaks in the art world. It's more about an art freed by the boundaries and the sovrastructures dictated by feelings and cultural constructs. Abstract research, instead, is more often than not - with the notable exceptions of neoplasticism and minimalism - very related to human feelings

**Maybe I'm wrong, but the way you described Caedmon's creative process, and what I've seen from his work, reminds me of a very, let's say, "natural approach" to creation. You mentioned fish and birds making something that could pass for art. Caedmon's creations could be seen as analogue to nature molding landscapes, mountains and trees; creative force without personality. Am I stretching it too much?**

I like this analogy actually

**It would be ironic, wouldn't it? A machine creating in ways that mirror Nature itself.**

Well actually Caedmon is mimicking, on purpose, the natural selection mechanism. This because the evolution is the only known process which can generate a 'best fitting solution' in a totally context-agnostic way. Even not having any idea, the 'blind watchmaker' managed to create such beautiful things and such perfect machinery, including here the human brain, which no man creation can equal. Given a starting point, 'things recognised as art', and an end point, 'generate things recognised as art'; giving also the equivalent to the evolutionary pressure, in our case the like of the people on social who can guarantee the survival of the best fittings, we have our small emulator of natural selection applied to art.

**I've noticed a use a language that touches on religious ideas or imagery when you talk about your work; not necessarily Christian, but religious or spiritual. Is there a spark of mysticism in your outlook on art?**

Art and religion often have points in common, and it could not be otherwise as the concept of creation, as well the concept of 'sublime', and transcendent, are common topics between them. Also, I've always been fascinated by religious mythology, especially the Christian one. Caedmon's own name derives from the name of a mediaeval poet who, the legend says, got his talent after a miraculous vision, as narrated in St. Bede's book 'the history of English church and people'

**You've also written about "mystical programmers", if i remember correctly. What's up with that?**

*[this question is about the concept for another project called "Algebra in formato audiovisivo per casalinghe di Voghera". Link: <http://www.algebrainformatoaudiovisivopercasalinghedivoghera.eu/>]*

As I said earlier in the interview, programming for me is more an act of creation than a fixed, cold process. It's a difference of approach which is pretty accentuated in this profession, and after a while you can easily guess who has this 'artistic' view about programming and who follows a more 'engineer-like' approach, which is though a perfectly fine approach. In absence of a better definition for this kind of developers, I guess that 'mystical programmers' is a term which can fit the purpose

**Oscar Wilde once mentioned that art is meant to surpass nature's apparently random approach to creation. I think this notion of impersonal art that you discussed clashed directly with Wilde's idea that art is meant to be un-natural, which is to say, in a way, very personal. What would be your response to Wilde's approach?**

I guess there are not two people in this world versed in the art world who will share exactly the same opinion on what art is and should be. Also, art makes sense only if interpreted in accordance with its times. Oscar Wilde was a dandy, and lived in a period when art was widely dominated by romantic ideas and ideals. The focus was on the man and its feelings, after centuries spent trying to chase an ideal-rational platonic perfection. In this framework, Wilde's statement makes perfectly sense. In the meantime, many things changed, and many new ideas popped out in the art world

**Would you prefer one over the other? As a matter of personal choice, of course.**

Personally, I prefer a non-descriptive, conceptual approach to art. My personal pantheon of artists includes names as Kosuth, Kruger, and Manzoni. There are also many other artists which I like, of course, including some who did figurative art. Constable, for his love for the English countryside, a passion we share. Hopper, whose opera powerfully communicates an infinite sense of solitude. And Escher, for his talent to depict a reality which is not real.

**One of the preferred themes of conceptual artists of the 50s and 60s, as far as I know, is the nature of consumption in the art world and also the world in general. Have you thought about the place that Caedmon and similar projects would have in the art market, and the consequences they would produce on the notion of what's "consumable" as art?**

**Also, coming back a bit to Wilde's notion that art is meant to surpass nature, do you think Caedmon's work holds any relation with nature? And if it doesn't, what is it connected to, what are its sources, being that Caedmon has no access to nature, no sensory experience to transform.**

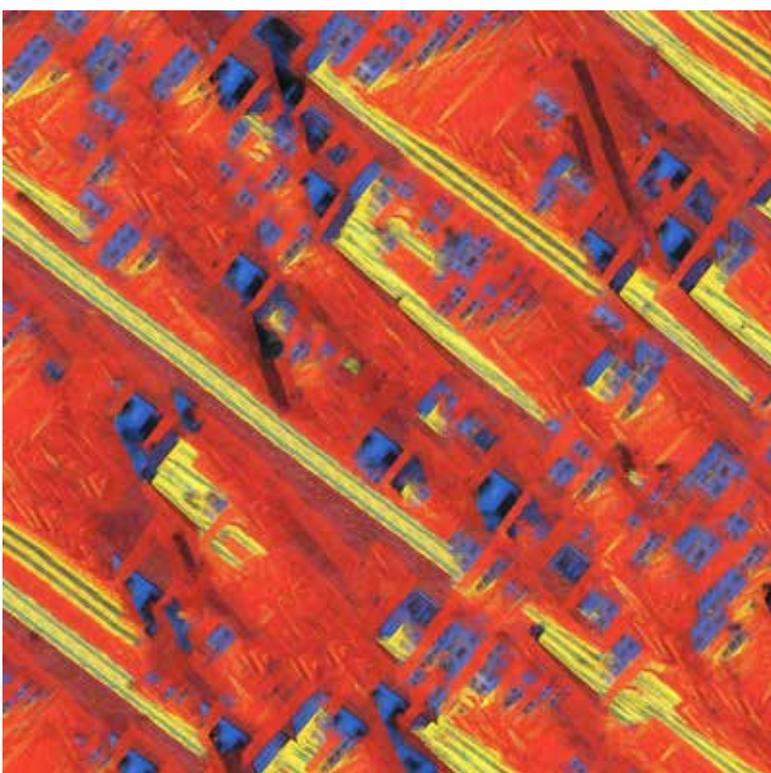
About the first question, one of the biggest questions I had to try to answer is which place could Caedmon have on an already hyperinflationated art market. At the moment, Caedmon creates one picture per hour. This is a self-imposed limit, as the theoretical limit with the current settings would be one image every 30 seconds. This would be way too much not only for managing to ever sell one of the images, but even for giving enough time to people to be able to see and evaluate every image. The problem with computer generated art will be, in my opinion, exactly this: the creation of art will become so fast that people will be unable to keep the pace. This also means, somehow, but this is just a speculation, that art market will have to adapt in order to avoid this hyperinflation caused by the flood of new works, and its total disappearance as a direct consequence. This is, as I said, a mere speculation, being the art market a pretty closed system with its own rules and its own gate keepers. In the particular case of caedmon, I also had another problem: his art has to be made as public as possible because his process broadly depends by the reaction of the public. The solution in this case was to starting accept donations, giving a small memorabilia in exchange, in such a way the first land artists used to finance their installations. In Caedmon's case, with a donation of at least 10\$ people can be listed as supporters on the project's website, and with any donation

of 20+ \$ they can get a Caedmon's picture of their choice signed and mailed to them, giving them also the insurance that the picture they request will be printed only once. Those donations helps a lot to cover the expenses for the project, mostly for the server costs and for promotion

About the second question, Caedmon's work is totally artificial, and it could not be otherwise. Ironically, as you pointed out, the process it uses to generate those works is instead very natural, in a certain way. His only sources are the huge training dataset with examples of 'what art is' and people feedbacks on the pictures caedmon create, something like 'this is possibly art, this is possibly not'. The rest is left to his own processes

**I just have one more thing to ask: do you have any High resolution images of Caedmon's work that I could use for the article?**

This one is the Caedmon's take on a paint by Luigi Russolo. This is part on a serie of high res pictures I'm generating with Caedmon for a future project, a crow founded computer generated book on Italian futurism. The project will be hopefully launched in the beginning of the new year to celebrate the 100th anniversary of the foundation of the 'futurist party' in 1918



Transcript of the interview conducted by César Cantú Hernández in August 2017 for the article *"CAEDMON: A MACHINE THAT DREAMS OF PAINTING"* published on thenews.mx website