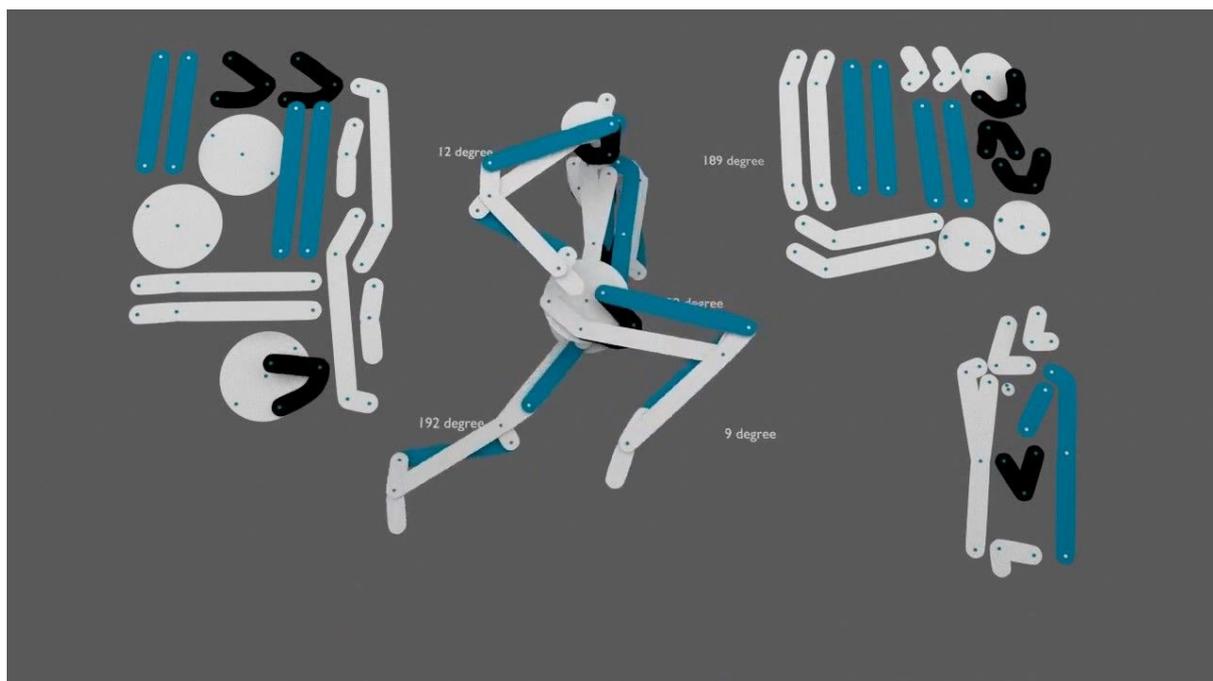


The research & development project of a universal biomechanical link mechanism for expressing voluntary movements of animal bodies

Specifically, My first specific invention was made in that late of year of 2012. After the many patience in difficult situation, I was inspired when I saw a 100 meter sprint at the London Olympics in August 2012. In November, a first invention of a human running movement mechanism was completed, and in December 2012 the invention of the fundamental biomechanical element was completed. Then I discovered the theorem of the voluntary movement of natural animal which is an invention of the universal biomechanical linkage element. In other words, mathematically, we have taken full control of the movement of animals. This means that the voluntary movement of all fuselages and limbs of animals, can be translated in a circular motion at a constant speed.

Work Plan 2. Biomechanical simulation of humans

Task 2.3 : Funkyman Running « <http://goo.gl/tSKt14> »



This link mechanism can accelerate his foot when kicking the ground, nevertheless, the source of its rotation keep always constant speed. Consequently, I can see that this mechanism show the best ideal more than the actual performance of the athlete. I think it is the will of the universe. if it is true, a similar mechanism might be applied to all body parts. said so, I also succeed to apply same principle of the mechanism to the body and arms. Also to other animals. thereafter, I realized examples of biomechanical locomotions of fishes, 4 legged animals, birds, insects, on the basis of the same theorem. I have found that the simplest comprehensive mechanism has the possibility of unlimited application.

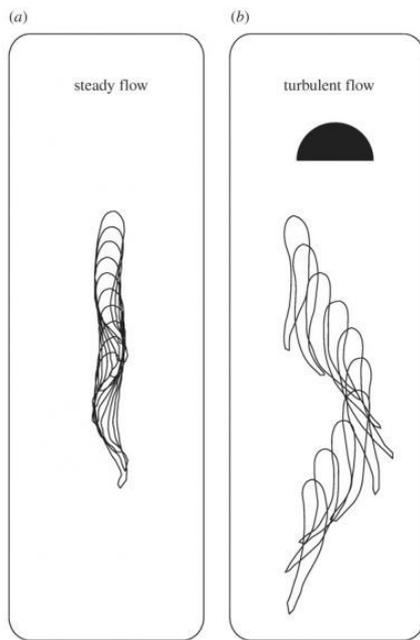
Work Plan 4. Biomechanical simulation of fishes

Task 4.1 : Fish swimming « <http://goo.gl/P4Ejhg> »

Work Plan 1. The universal mechanical linkage for the voluntary movement

Task 1.1 : Primary embodiment « <http://goo.gl/TP12MD> »

Task 1.2 : Secondary embodiment « <http://goo.gl/5P5KHb> »

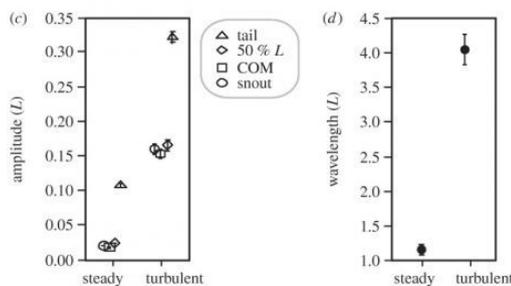


When I examine on the biomechanical simulation of the human running, I found a key in the fish movement immediately.

When I saw the figure of a fish swimming, I laughed involuntarily. because it seems to be the same locomotion of the human legs.

Be present in common to these, it's a natural fluid phenomena. that is the vortex and the turbulence. In other words, insofar as there is fluid phenomenon, through the evolution, the mechanism of the body of organisms being optimized thereto.

The theorem of the voluntary movement of natural animals and that biomechanics are related to the Karman vortex street of fluid dynamics and continuum mechanics.



So, natural animals make movement of straightforward while generating a reverse flow against each vortices of Karman vortex street as stepping stones.

In the Wing Chun Kung Fu as a chinese martial art, there is a same principle leading to this mindset. Challenge the obstacles in front without retreat, while generating a reverse hand movement, utilize the obstacles as a stepping stone to move forward. means that rushing to hardship just so for seize upon the ideal.

Biomechanical simulation of Wing Chun : a work in progress (1) « <https://youtu.be/q8bs8cTRISc> »



After that, in January 2013, I found the microfilm of the essay of Abraham-Louis Breguet, a horologist - mechanist of Neuchatel in the 18th century, in the underground storage room of the French National Library. So, the French government welcomed my business and allowed all the actions concerning my project for three years.

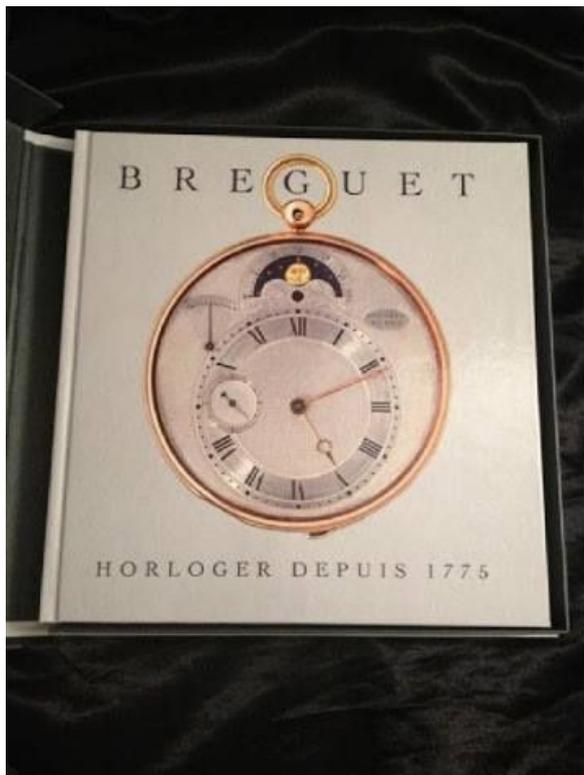
"Essay about the animal force and the principle of voluntary movement" - Abraham Louis Bréguet (1811) : « http://varipon.com/Essay_A-LBreguet1811.pdf »

In his essay, I found a new theory of voluntary movement and animal force. In this way, I decided to promote a new research and development by combining his theory in my invention based on a midway of physics, physiology and philosophy. This is my philosophical approach.

“There are two forces in the universe, the movement and the will. the movement controls the matter and the will controls the movement, which is essential to the living matter. The living bodies are in equilibrium with the movement of the earth while the planetary movement is reflected within the living bodies. Such concepts as conception and free will are related to the planetary motion, and the voluntary movement of living bodies could be the product of these two elements.”

A-L Breguet paid attention to the movement of rotation that appears within nature and its phenomena - he invented a mechanism called "Tourbillon" which consists of a regulator producing constant speed while removing the effects of gravity. His descendant, Louis-Charles Breguet inherited A-L Breguet's insight into the planet environment and the voluntary movement of animal. He also invented the gyroplane to fly in the sky by the rotational movement as same principle and he found a formula for Aircraft range & endurance. in my work I focus on turbulence as well, a phenomenon that's also related to the rotation of the Earth and which I believe affects the universal biomechanics of the voluntary movement. Therefore I wish to explore this concept further.

On September 17, 2013 - Abraham-Louis' birthday – I was granted the honor of an invitation to visit the Breguet Museum at the Place Vendôme in Paris with its director Mr. Emmanuel Breguet, historian and member of Breguet family's seventh generation. We discussed A-L. Breguet's new unknown theory and I told him I wished to continue his ancestor's study.



From sir Emmanuel Breguet

"To Yutaka, skillful horologist mechanic who appreciates the work of Breguet, I dedicate an art and history book, Very cordially and my congratulations - Emmanuel Breguet - 17 September, 2013

I think there is a deep relationship between human inventions and biological evolution. The more trials and efforts are given, the more sophisticated will the inventions be. For people's health and progress of humanity, I do inventions.

I'm reaffirming a philosophy based on the theory of animal force proposed by Abraham-Louis Breguet, a Swiss watchmaker at 200 years ago. Abraham-Louis Breguet explain that as planetary revolutions could be the sole source of all the movements of inanimate matter, and of those which are exercised by all terrestrial bodies.

As planetary revolutions appears universally as a fluid phenomenon typified by the vortex in natural environments. When animals generate their own motions, they naturally obtain the movement of the planet. for example, when carps climb the waterfall, they use turbulence phenomena as a stepping stone. That is depends to the rotation of Earth.

The rhythm of the planet's revolution affects all biological and social activities while regulating to keep the constant speed. I will therefore actively encourage the importance of integration with the global environment. In the current industry, cycle of mass production and mass consumption are too accelerated. It is largely deviated from the original rhythm of the earth.

Therefore, while attenuating the excessive acceleration of wasteful mass production and mass consumption, but I will promote the flexibility manufacturing system to deal with various types of production of small amount.

To that end, I provide an versatile straightforward biomechanical element having infinite applications. and I work to create new job opportunities and to diversify a market approach allows various manufacturers internationally. Craftsmanship will be once again recognised and restored.

« All bodies on Earth are constantly filled with movement and force, as the fountain we said always filled with water: the fountain is in equilibrium with the source, the bodies are with the movement of the earth. Among the diversity of bodies that are on the surface of the globe, there are those who, being organized and talented from an internal power that we called will, have, relative to the movement of the earth, the same disposition that to the fountain relatively to the water of the inexhaustible source.

The planetary revolutions could be the unique source of all the movements of inanimate matter, and those who exercise all terrestrial bodies. On the other hand, we know that animated matter is endowed with another active principle called will. The link that binds the spirit to the material; because the will is a faculty of the spirit, has access to the movement, which is a faculty rather than a proprietary of the material.

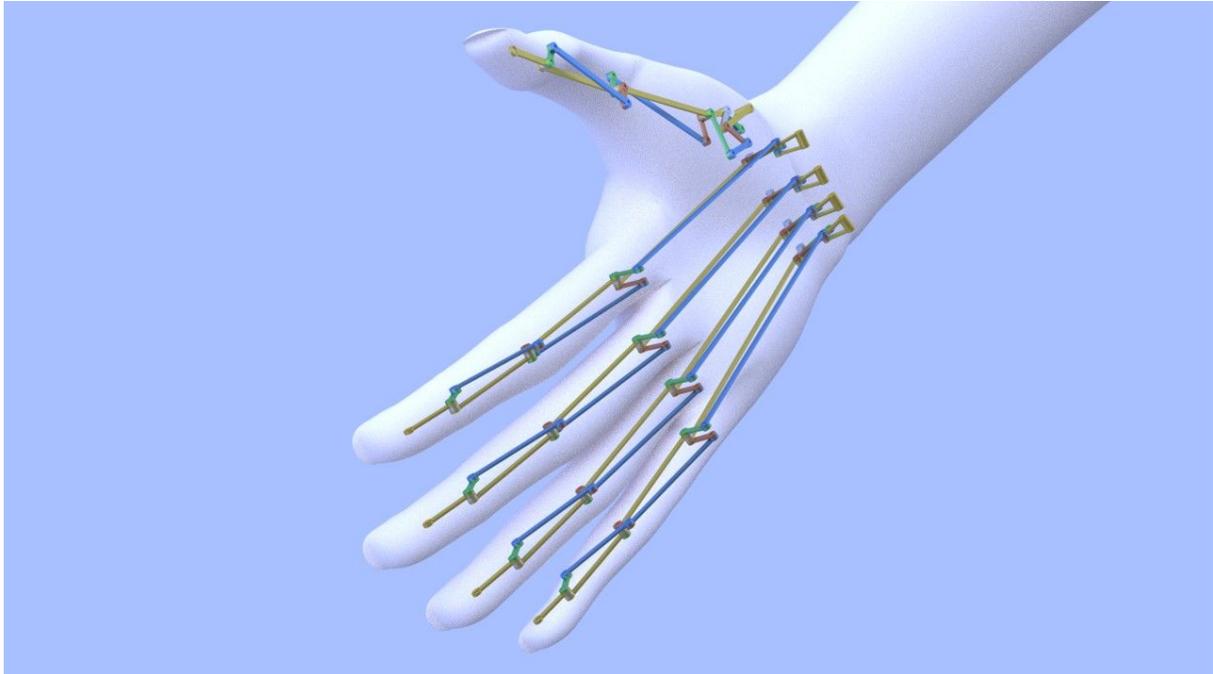
The will is the extreme ring of the intellectual chain on the material side , the movement also is the extreme ring of the material chain on the spirit side, and the linking of these two rings binds the morale to the physics. (This will form a phantom limb syndrome.) the movement is indestructible, and can say with accuracy that is not and that's all. As a universal agent, as energetic and inexhaustible, whose constant action gives life to material, and maintains, as it were, out of nothing, must be immaterial, and appears to be the soul of the universe.

The will and the movement are two powers of a species, if not identical, at least the most analogous in the series of agents of nature. » - "Essay about the animal force and the principle of voluntary movement", Abraham Louis Bréguet (1811)

« http://varipon.com/Essay_A-LBreguet1811.pdf »

Work Plan 2. Biomechanical simulation of humans

Task 2.5 : Hands, the automatisme in orthopedics « <https://goo.gl/MnUWgX> »



Let us glorify the divine providence of bodies and spirits.

I dedicate this development to François de La Noue, surnamed Iron-arm, the great Huguenot captain.

I'm feeling revelatory experiences about this work just as if God had given a social contract to me. Because after meeting with Master Cornelia Gruber in June, I saw a person without both arm in La Chaux-de-Fonds. I guess probably that he was a victim of war that accepted as a refugee. Here I met also a refugee from Eritea. He told me that he want return to his country but there is a dictator bully the people and lack of water.



Work Plan 8. Biomechanical simulation of fishes fin

Task 8.7 : Jellyfishes « <https://goo.gl/1AiYRG> »

I notice the similarity relationship between jellyfish fins and ideal hand finger movements.

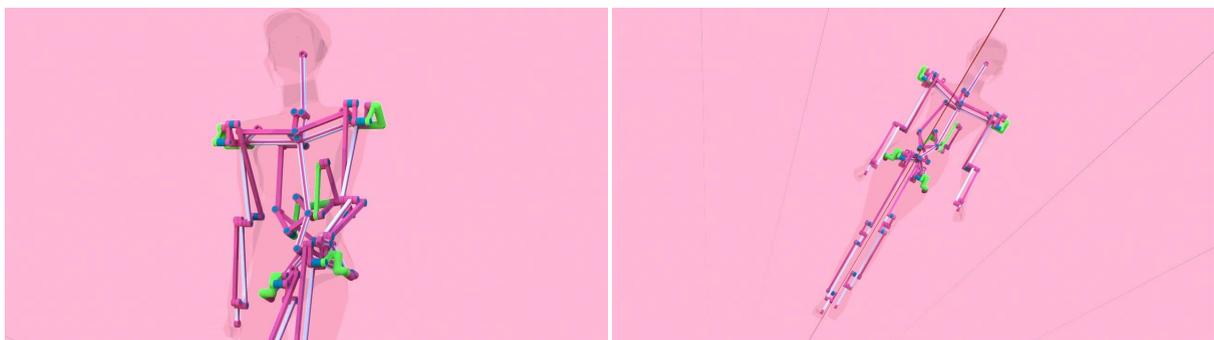
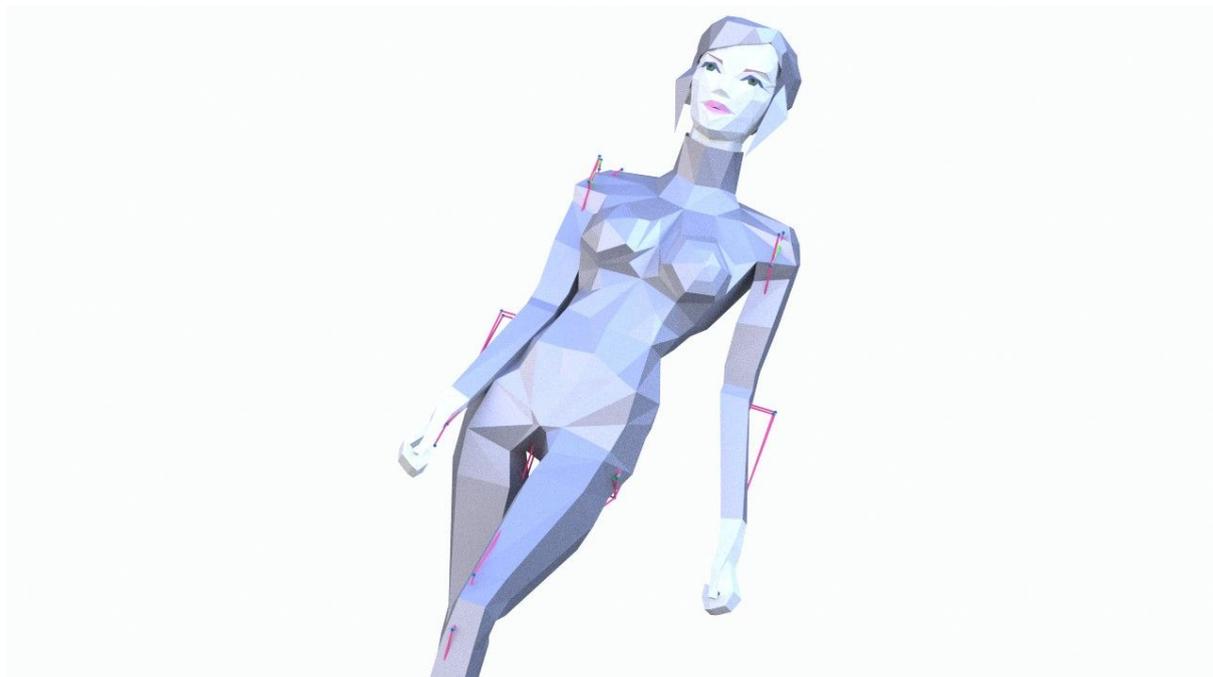
« One of universal nature is like water; The highest good is like water. »

This is the idea that becomes the basis of my future project in Switzerland.

Work Plan 2. Biomechanical simulation of humans

Task 2.4 : Feminin Walking « <http://goo.gl/0OqMXi> , <https://vimeo.com/127995947> »

Biomechanical simulation of feminine walk. during three months, I carefully promoted. Pitching and Rolling, both synchronization are not easy.



I designed on this model for a Noble lady. Cydney Kohler Gorham V is a senior official in Chicago, the fifth generation of the family of Gorham Manufacturer which houses silverware in the White House since the establishment of the United States America. She is jeweller who had a job of decorating the presidential air plane, "Air Force One" and the FBI guns.

Task 2.6 : Biomechanical simulation of Crawl swimming

« <https://goo.gl/Mpl1po> , <http://varipon.com/index.php/work-plan-2/task-26/> »



Biomechanical simulation of Crawl swimming

The shoulder-arm biomechanical movement is the most complicated mechanism ever. It's a very realistic and sophisticated movement.

Using our formula of voluntary movement based on the diamond rhombus configuration derived from Chinese martial arts' centerline theory (<https://goo.gl/KfCvpx>), all the arms swing and bending/stretching movements, also the spine and the leg movements are able to be realized by constant rotation powers. It can be realized with In-wheel electric motors.

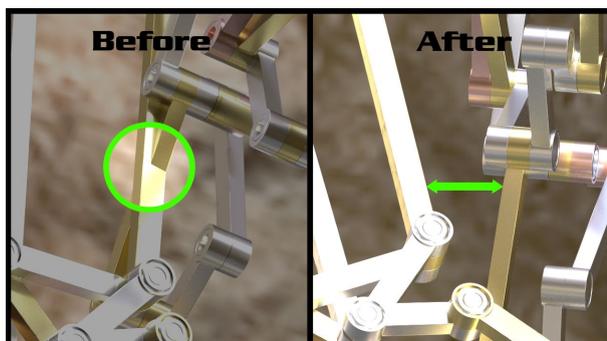
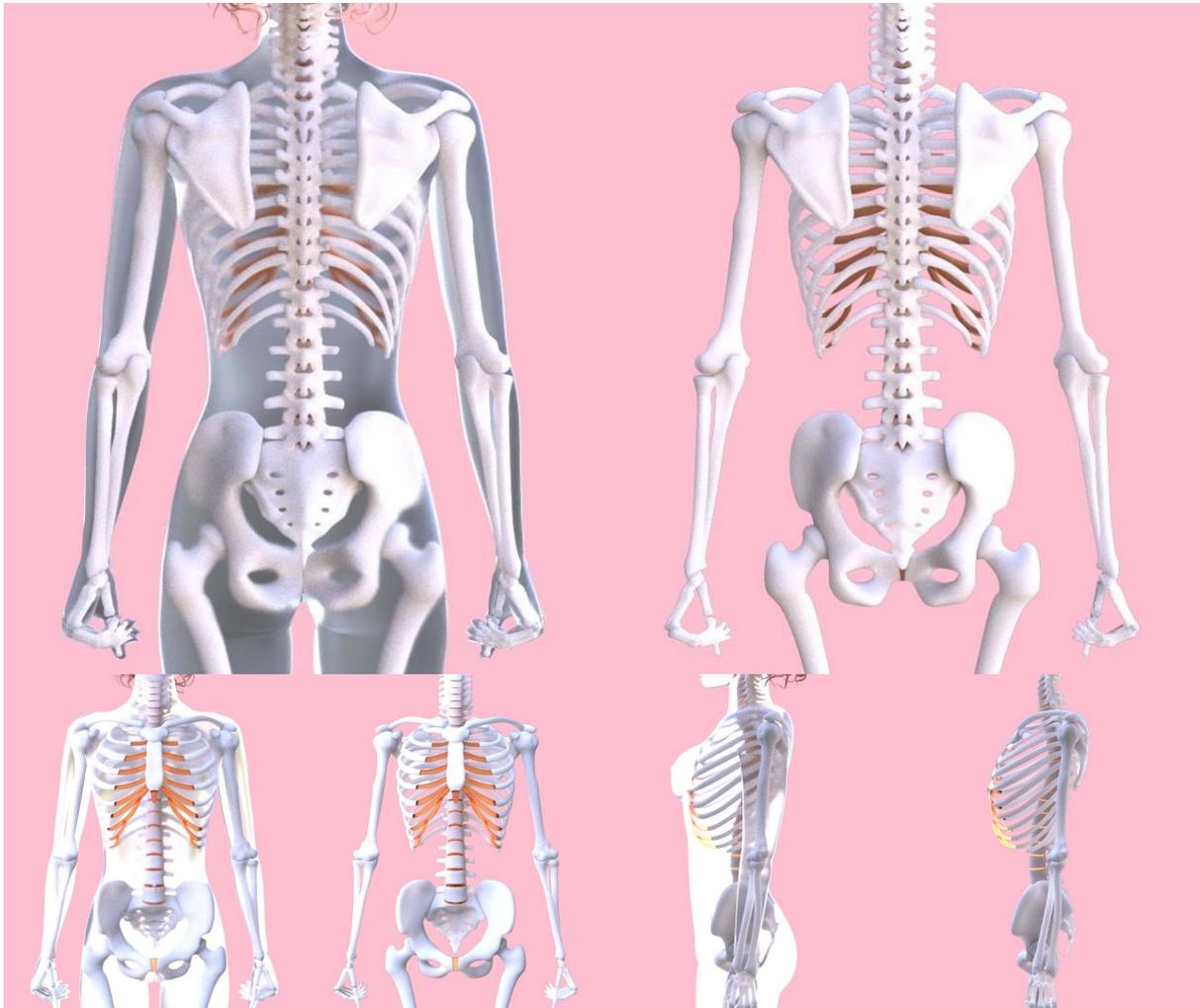


Production for digital sculpting

While using the formula of voluntary movement, we can develop a image based neuro orthopedic training/rehabilitation or medical education with the new image guided application platforms based on Augmented Reality such as the Microsoft Hololens. « <https://youtu.be/MVXH5V8MVQo> »

I was taught an interesting story. As an attempt of cancer treatment, there is a method while visualizing and looking the affected part of the cancer tumor and strongly imagine preying it. This seems to activate immune cells.

Thus I think it also is good to watch movie scenes where a hero knocks down a lot of bad guys. so strongly imagine the hero is a Natural killer cell and the bad guys are as cancer cells. It is important to believe strongly that there is no impossible and there is always a solution.



Adjustment : If two movements are too close, interfere. leave space between the two movements' distance.

Holistic work plan is organized into the following ten work packages :

Work Plan 1. The universal mechanical linkage for the voluntary movement

Task 1.1 : Primary embodiment « <http://goo.gl/TP12MD> »

Task 1.2 : Secondary embodiment « <http://goo.gl/5P5KHb> »

Work Plan 2. Biomechanical simulation of humans

Task 2.1 : Running « <http://goo.gl/TJDSJX> »

Task 2.2 : Walking « <http://goo.gl/xsq9Mg> »

Task 2.3 : Funkyman Running « <http://goo.gl/tSKt14> »

Task 2.4 : Feminin Walking « <http://goo.gl/0OqMXi> »

Task 2.5 : Hands or The automatism in orthopedics « <https://goo.gl/MnUWgX> »

Task 2.6 : Crawl swimming « <https://goo.gl/Mpl1po> »

Work Plan 3. Biomechanical simulation of multi legs

Task 3.1 : Horse gaits « <https://vimeo.com/195588907> , <http://goo.gl/DCKNTN> »

Task 3.2 : Leopard running « <http://goo.gl/MYirCz> »

Task 3.3 : Dung beetle running « <https://vimeo.com/146872666> , <https://goo.gl/1uoiqc> »

Task 3.4 : Millipede walking « <https://goo.gl/qaPn5P> »

Work Plan 4. Biomechanical simulation of fishes

Task 4.1 : Fish swimming « <http://goo.gl/P4Ejhg> »

Work Plan 5. Biomechanical simulation of birds

Task 5.1 : Falcon flapping « <http://goo.gl/A9XWJ9> »

Work Plan 6. The formula of the voluntary movement

Task 6.1 : The formula « <http://goo.gl/bKevoS> »

Task 6.1a : The divine formula « <http://goo.gl/CbdmWO> »

(This is feedback from WP 9 as a nested Formula)

Task 6.2 : The octagonal formula « <http://goo.gl/j3z7rL> »

Task 6.3 : Method using the Inverse kinematics « <http://goo.gl/NCgbth> »

Task 6.4 : Flow of trigonometric functions « <https://goo.gl/tk9uAa> »

Task 6.5 : The diamond rhombus configuration « <https://goo.gl/eSNaF0> »

Work Plan 7. Biomechanical simulation of serpents

Task 7.1 : Serpent crawling « <https://goo.gl/llEVFf> »

Work Plan 8. Biomechanical simulation of fishes fin

Task 8.1 : Rays « <http://goo.gl/XihZNT> »

Task 8.2 : Anomalocaris « <http://goo.gl/v47j7G> »

Task 8.3 : Largehead hairtails « <http://goo.gl/M6ARvR> »

Task 8.4 : Sea turtles « <http://goo.gl/zawS7n> »

Task 8.5 : Angel fishes « <http://goo.gl/zawS7n> »

Task 8.6 : Schinderhannes bartelsi « <http://goo.gl/v47j7G> »

Task 8.7 : Jellyfishes « <https://goo.gl/1AiYRG> »

Work Plan 9. Biomechanical simulation of divine flight

Task 9.1 : Drone beetles « <https://goo.gl/pjws8C> , <https://goo.gl/oM4k10> »

Task 9.2 : Dragonflies « <https://goo.gl/A0vR4X> »

Task 9.3 : Bats and Divine formula :

« <https://goo.gl/PJJyFl> , <https://goo.gl/JfwMnc> , <https://vimeo.com/152264330> »

Task 9.4 : Bees : « <https://goo.gl/7KjSZi> »

Task 9.5 : Hamming birds and Airfoil « <https://goo.gl/tSKkN0> »

Task 9.6 : Natural airfoil and Alternative formula « <http://goo.gl/O3Tm0N> »

Work Plan 10. Simulator

Task 10.1 : Lo-Th 's WebGL simulator "Turbulence"

« <http://goo.gl/MShsfy> , <https://github.com/varipon/Turbulence> »

Task 10.2 : Françoise Jacot's Geogebra demo « <http://goo.gl/LtNDGU> , <http://goo.gl/tPTSm9> »

PDF file : « <http://goo.gl/LzzOp2> , <http://goo.gl/K8iTRx> »

Product / Service

My primary business as a platform company (fables) is to design of artificial movements based on mathematical theorem and formulas of the voluntary movement of natural animals. (In this universe, I am the only person who has mastered this new theory of physics and possesses a know-how to practice it.)

There is a perception of limbs which does not exist materially. this is called 'phantom limb' sensation. I heard that acupuncture is effective for the pain caused by this phantom limb. Merleau-Ponty also quotes it in phenomenology. It seem like that the cause of this syndrome is "Qi" and "Bone's movement" so explained by the Chinese martial arts masters.

And for the next-generation medical care, it is important to modeling this non-material bodies or agents in a virtual (digital) way. If possible, manage it by a transparent distributed database as Blockchain. Then treatment make while possessing it with the method of visualization or materialization.

Thérapie miroir - version longue avec miroir : <https://youtu.be/XmSFWPJsIHY>

This is a neuro-orthopedic rehabilitation method that is effective as a treatment for hemiparesis. By visually perceiving the movements of the limbs reflected on the mirror, rehabilitation of half paralyzed limbs becomes possible. It is practiced in university hospitals in Switzerland and elsewhere. By combining this perceptual exercise mirror therapy with Chinese martial arts, better rehabilitation will be possible.

When I saw this exercise therapy method, I immediately imagined "Siu Nim Tao" the first open-hand form of Chinese martial art called Wing Chun. It has a nurturing effect of "Qi (Chi)" and is a practice that lead to Still dynamics training of "Zhan Zhuang" (站桩: Standing tree) of "Da Cheng quan/chuan" (大成拳).

Siu Nim Tao : <https://youtu.be/DacABycvHBk> ,

Zhan Zhuang : <https://youtu.be/y07FauHYImg>

Da Cheng quan : <https://youtu.be/h9A1BsHPyJY>

I am further thinking to extend this treatment to next generation medical care and apply it to augmented reality devices and mathematical formulas and theorem of voluntary movements of animal bodies that I discovered. In this way, a voluntary movement model brought by universal biomechanical link mechanism will be as a phantom limb's numerical parameter, and should be transformed its shape with the client's will. so, It's important to provide opportunities on the Internet that allows clients to flexibly customize artificial phantom limb's parameters at any time. The clients' order are handled as digital data and will be stored in the Blockchain database.

By materializing and visualizing these numerical data, it can be provided as prosthetic limbs or as treatment method for hemiparesis using augmented reality, or as animal drones. It will be realized with open horizontal division of labor to match the suppliers' will and the clients' order. The details on this data can be consulted only by the customer and the supplier entrusted by the customer. Others only know that the data exist and made updates. In this way, the shape of the product will develop with the owner and the suppliers.

For example, artificial prosthesis for children are necessary to frequently replace in response to growth, long-term quality is not necessary. Thus it should be changed the virtual digital data at any time for size and ratio of hand proportion as customers grow. and Polylactic acid (PLA), a plastic substitute made from fermented plant starch (usually corn) is suitable as a material for physical implementation while keeping the sustainability of the global environment. And utilize 3D printers so

that they can be manufactured anytime and anywhere. On the other hand, in the case of adults, the body shapes do not deform immediately, so there is not many change in the data. However, for physical implementation, long-term quality is required and the material and manufacturing process also becomes sophisticated for high aesthetic finition.

For example, the traditional Swiss manufacturing process has the following steps.

- Polishing (Polissage)
- Crimping (Sertissage)
- Decolletage
- Electroplating (Galvanoplastie)
- Milling (Fraisage)
- Stamping (Etampage)
- Rectifying (Rectifiage)
- Swivel (Pivotage)
- Rolling (Roulage)
- Molding (Moulage)
- Assembly (Assemblage)
- Bonding (Ligotage)
- Cutting (Taillage)

By selecting the processes necessary to meet customer needs, clients can choose the optimal quality. Ultimately, I think the added value of the product will be aggregated into the virtual digital data held in Blockchain database. For the manufacture of Swiss watches is the same way. If we find added value to the virtual data of the product, no change will occur in the value of product no matter where we make the parts to physically implement it. So always virtual data is Swiss made regardless of location, and when repairing, clients can ask the nearest supplier.

I should specify my main business as below.

- I provide conceptual models of artificial movements based on the theorem of the voluntary movement of natural animals.
- The visualization of the artificial voluntary movements allows a image guided therapy using augmented reality.
- The materialization of the artificial voluntary movements allows a physical implementation of medical devices, for example a production of automatic prostheses as well as high mobility versatile biomechanical limbs for drones.

I'll get revenue from following. So, I work on concept design of products based on my inventions.

- Basic design for new products
- Product customization
- Digital data management
- Materialization-Visualization

Physical implementation is achievable by outsourcing production to vendors according to customer order according to following e-commerce services.

- Customizable product design services on the Internet
- Database of suppliers and subcontractors corresponding to the manufacturing processes
- Transparently distributed database like the block string to update the custom settings data according to the clients' need

Image guided therapy is achievable by multimodal accessibility and user interface therefore like Microsoft Hololens such as augmented reality which improve physical limits of human activities.

- Mirror symmetric bimanual movement therapy for hemiplegia or phantom limb pain

THEOREM

about the fundamental theorem of the voluntary movement of natural animal and the formula

Now I explain you about the fundamental theorem of the voluntary movement of animal as well as the invention of the universal mechanical linkage.

It concerns a link mechanism for expressing natural animal motion has N link elements, each being formed by coupling of a joint (γ_n) and a joint (β_n) , the joint (γ_n) and a joint (δ_n) , and the joint (δ_n) and a joint (β_{n+1}) .

The multiple link elements are coupled together by the joints (γ_n) and the joints (γ_{n+1}) . A joint (β_1) is coupled to a fulcrum (α_1) and is disposed so as to be capable of revolving in an orbit centered on the fulcrum (α_1) .

A joint (δ_1) is coupled to a joint (γ_1) via a fulcrum (α_2) disposed so as to maintain a constant mutual positional relationship with the fulcrum (α_1) , or a fulcrum (α_2) disposed such that the mutual positional relationship with the fulcrum (α_1) can be varied.

The joint (δ_1) and the joint (γ_1) are disposed so as to be capable of revolving in an orbit centered on the fulcrum (α_2) so as to maintain a constant mutual positional relationship with each other. See the lower figure.

I describe about the optimal condition to meet each volunteer movement cycle based on the above.

An angle formed by two segments $[(\alpha_2),(\gamma_1)]$ and $[(\alpha_2),(\delta_1)]$ having the same origin (α_2) is immutable. An angle formed by two segments $[(\gamma_n),(\beta_n)]$ and $[(\gamma_n),(\gamma_{n+1})]$ having the same origin (γ_n) is immutable.

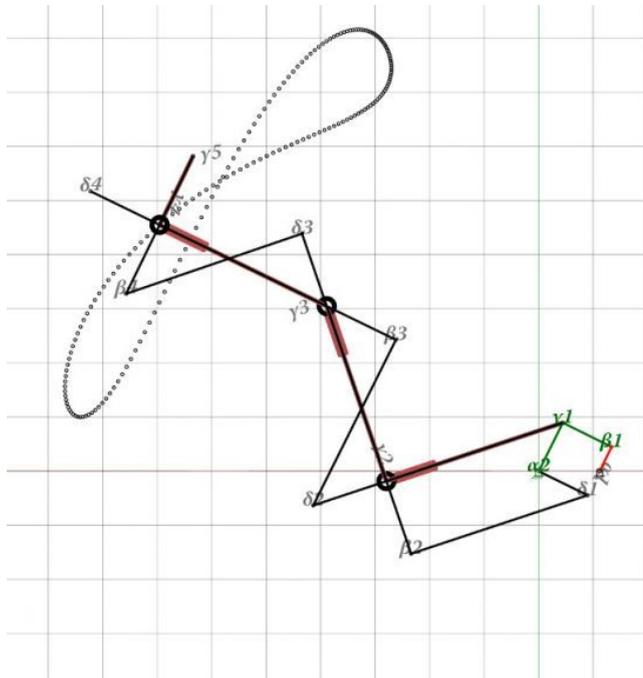
An angle formed by two segments $[(\gamma_{n+1}),(\gamma_n)]$ and $[(\gamma_{n+1}),(\delta_{n+1})]$ having the same origin (γ_{n+1}) is immutable.

When the pivot (α_1) is disposed on a segment $[(\beta_1),(\delta_1)]$, then four segments $[(\beta_1),(\delta_1)]$ and $[(\delta_1),(\alpha_2)]$ and $[(\alpha_2),(\gamma_1)]$ and $[(\gamma_1),(\beta_1)]$ should be disposed on a relationship of four sides constituting as a segment $[(\beta_1),(\alpha_2)]$ intersects the center of a segment $[(\gamma_1),(\delta_1)]$. and if the segment $[(\beta_1),(\alpha_2)]$ is the bisector of an angle formed by two segments $[(\gamma_1),(\alpha_2)]$ and $[(\delta_1),(\alpha_2)]$, this articulated mechanism would work best.

Here, the (n) is an integer that is greater than or equal to 1. A segment connecting two joints A and B is denoted $[A, B]$

I explain about a mechanical linkage element formed by coupling from the pivot (α_1) to the joint (γ_5) . This is a part of the animal movement as a body, a limbs, a fin of fishes, a wing of insects and birds. (See <https://goo.gl/W87vfY>)

« the lower figure » : The formula was able to get by adjusting the parameters on this theorem.



$A > 0$

$$[(\alpha_1), (\beta_1)] = A \cdot 0.5$$

$$[(\alpha_2), (\delta_1)] = [(\alpha_2), (\gamma_1)] = [(\beta_1), (\gamma_1)] = A$$

$$[(\alpha_1), (\delta_1)] = (A - [(\alpha_1), (\beta_1)])$$

$$[(\alpha_1), (\alpha_2)] = \sqrt{[(\alpha_1), (\delta_1)]^2 + [(\alpha_2), (\delta_1)]^2}$$

$$B = ([(\alpha_2), (\gamma_1)]^2 + [(\alpha_2), (\delta_1)]^2)$$

$$[(\gamma_1), (\delta_1)] = \sqrt{B}$$

$$[(\beta_2), (\gamma_2)] = \sqrt{B}$$

$C = B$

$$[(\gamma_2), (\delta_2)] = \sqrt{C}$$

$$\angle (\beta_1)(\gamma_1)(\gamma_2) = 135^\circ$$

$$[(\gamma_3), (\delta_3)] = \sqrt{C}$$

$$\angle (\gamma_1)(\alpha_2)(\delta_1) = 90^\circ$$

$$[(\beta_3), (\gamma_3)] = \sqrt{C}$$

$$\angle (\gamma_1)(\gamma_2)(\delta_2) = 180^\circ$$

$$[(\beta_4), (\gamma_4)] = \sqrt{C}$$

$$\angle (\beta_2)(\gamma_2)(\gamma_3) = \angle (\beta_1)(\gamma_1)(\gamma_2) + 45^\circ$$

$$[(\gamma_1), (\gamma_2)] = C + \sqrt{C}$$

$$\angle (\gamma_2)(\gamma_3)(\delta_3) = 180^\circ$$

$$[(\beta_2), (\delta_1)] = C + \sqrt{C}$$

$$\angle (\beta_3)(\gamma_3)(\gamma_4) = 180^\circ$$

$$[(\gamma_2), (\gamma_3)] = C + \sqrt{C}$$

$$\angle (\gamma_3)(\gamma_4)(\delta_4) = 180^\circ$$

$$[(\beta_3), (\delta_2)] = C + \sqrt{C}$$

$$\angle (\beta_4)(\gamma_4)(\gamma_5) = 180^\circ$$

$$[(\gamma_3), (\gamma_4)] = C + \sqrt{C}$$

$$[(\beta_4), (\delta_3)] = C + \sqrt{C}$$

Work Plan 6. The formula of the voluntary movement

Task 6.1 : The formula « <http://goo.gl/bKevoS> »

2016.2 - a

A mathematics teacher of Chinon, Mrs Françoise Jacot did describe in her words the construction process for our formula. it's a great job already.

PDF file : http://varipon.com/Procédé_de_construction.pdf

Procédé de construction

$A > 0$

θ curseur animé croissant de 0 à 2π

α_1 point fixe sur (Ox)

$$\text{caché } U \left(x(\alpha_1) + \frac{A}{2}; 0 \right)$$

$\beta_1 =$ rotation centre α_1 angle θ sens horaire (U)

$$\alpha_2 \left(x(\alpha_1) - \frac{A\sqrt{5}}{2}; 0 \right)$$

γ_1 tel que $\beta_1 \gamma_1 = A$ et $\alpha_2 \gamma_1 = A$

$\delta_1 =$ rotation centre α_2 angle $\frac{\pi}{2}$ sens anti-horaire (γ_1)

caché

$\beta_1' =$ rotation centre γ_1 angle $\frac{3\pi}{4}$ sens horaire (β_1)

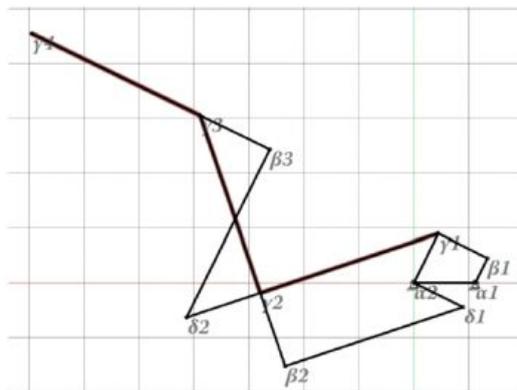
γ_2 et δ_2 sur $[\gamma_1 \beta_1']$ tels que $\gamma_1 \gamma_2 = 2A^2 + A\sqrt{2}$ et $\gamma_1 \delta_2 = 2A^2 + 2A\sqrt{2}$

$\beta_2 =$ translation $\frac{\gamma_1 \gamma_2}{\gamma_1 \gamma_2}$ (δ_1)

γ_3 sur $[\beta_2 \gamma_2]$ tels que $\beta_2 \gamma_3 = 2A^2 + 2A\sqrt{2}$

β_3 tel que $\gamma_3 \beta_3 = A\sqrt{2}$ et $\delta_2 \beta_3 = 2A^2 + A\sqrt{2}$

γ_4 sur $[\beta_3 \gamma_3]$ tel que $\beta_3 \gamma_4 = 2A^2 + 2A\sqrt{2}$



Task 6.2 The octagonal formula « Work Plan 6. The formula of the voluntary movement »
 « <https://vimeo.com/142758713> »

The formula of the voluntary movement that we have seen was part of the octagonal linkage. This octagonal linkage can be stacked spirally infinitely. If each voluntary movement is regarded as a fruit, the formula (a linkage, from (α_1) up to (γ_5) : <https://goo.gl/LsmBV2>) is regarded as a seed, and this octagonal infinite linkage is regarded a tree of voluntary movement. The octagonal formula is an infinitive element. Small extension affects gradually. When the links number is small, the difference is not noticeable. However, when the number has increased more, we can clearly see the difference. (In the demo video : left side : without stretch margin. right side : stretch margin included.)
 The laws of nature have a very large margin. That is why it took a long time to find the formula of voluntary movement from the days of Leonardo da Vinci.

2016.1 - b

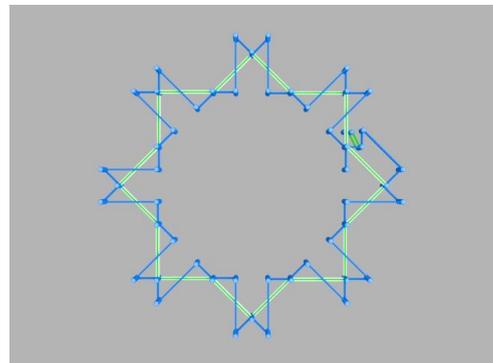
A mathematics teacher of Chinon, Françoise Jadot made a demo of basic formula with GeoGebra. It's very interesting. Please take a look following :

<https://tube.geogebra.org/m/2365099>

Task 6.2 : The octagonal formula « <http://goo.gl/j3z7rL> »

2016.1 - c

A mathematics teacher of Chinon, Mrs Françoise Jacot did describe in her words the construction process for our octagonal formula. it's a great job already.



Procédé de construction bras articulé Octogone

θ curseur animé croissant de 0 à 2π

$a_1(3,75 - 0,5\sqrt{2}; 1 + 0,5\sqrt{2})$ et $a_2(4 - 0,5\sqrt{2}; 0,5 + 0,5\sqrt{2})$ point fixe sur (Ox)

caché $U(4 - 0,5\sqrt{2}; 1 + 0,5\sqrt{2})$

b_1 = rotation centre a_1 angle $\theta + \pi$ sens horaire (U)

c_1 tel que $b_1 c_1 = 0,5$ et $a_2 c_1 = 0,5$

d_1 = rotation centre a_2 angle 90° sens anti-horaire (c_1)

caché b_1' = rotat $^\circ$ centre c_1 angle 135° sens horaire (b_1)

c_2 et d_2 sur $[c_1 b_1')$ tels que $c_1 c_2 = 1 + 0,5\sqrt{2}$

et $c_1 d_2 = 1 + \sqrt{2}$

b_2 = translation $\frac{c_1 c_2}{c_1 c_2}$ (d_1)

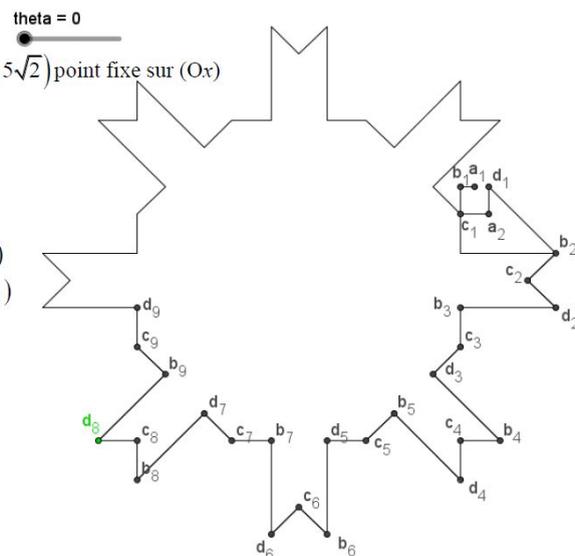
À partir de $n \geq 2$ deux règles simples :

- les points b_n, c_n, c_{n+1} et d_{n+1} sont alignés tels que

$$b_n c_{n+1} = 1 + \sqrt{2} \text{ et } b_n d_{n+1} = 1 + 1,5\sqrt{2}$$

- le point b_{n+1} s'obtient en remarquant que :

$$b_{n+1} c_{n+1} = 0,5\sqrt{2} \text{ et } b_{n+1} d_n = 1 + 0,5\sqrt{2}$$



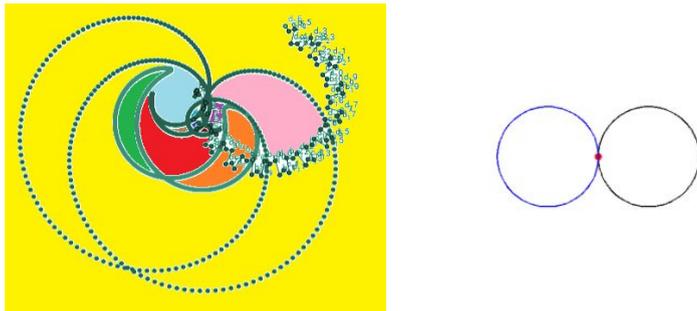
PDF file : http://varipon.com/Procede_de_construction_du_bras_octogonal.pdf

2016.1 - d

A mathematics teacher of Chinon, Françoise Jadot made a demo of the octagonal formula with GeoGebra. It's very interesting. : <https://tube.geogebra.org/m/2409961>

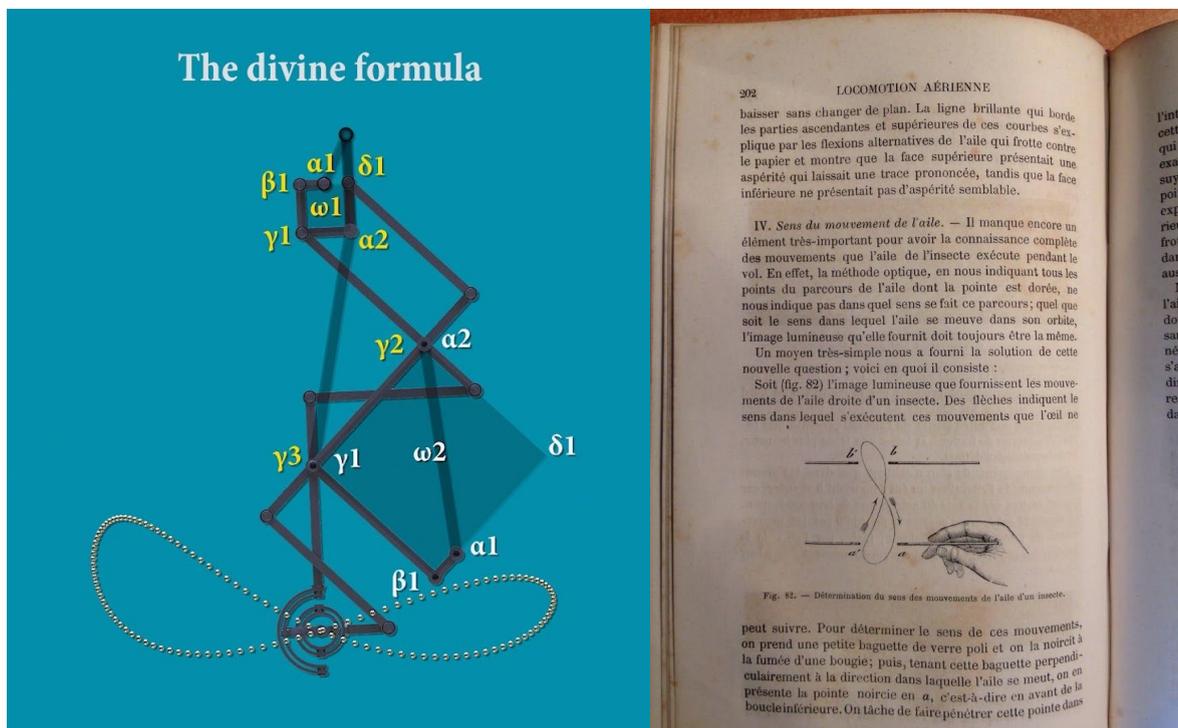
2016.1 - e

Our octagonal formula now is alive and very happy with the math teacher. She explains that this is similar with the Cardioid curve. <https://en.wikipedia.org/wiki/Cardioid>



Task 6.1a : The divine formula « <http://goo.gl/CbdlmWO> »

(This is feedback from WP 9 as a nested Formula)



Right : The movement of the wing of an insect.

« The animal machine, terrestrial and aerial locomotion » - Etienne-Jules Marey 1873,

2016.1 - a : « <http://goo.gl/CbdlmWO> »

2016.1 - b

The basic formula was focused on the feature extraction. :

<http://varipon.com/index.php/work-plan-6/task-6-1-formula/>

The following divine formula is integrated the overall proportion.

Details :

Two same mechanisms, a mechanism (ω_1) meaning a animal limbs or wings and a mechanism (ω_2) meaning a animal bodies should be disposed on a nested relationship. that is, two fulcrums (α_1) and (α_2) constituting the mechanism (ω_1) are linked to the segment $[(\gamma_1),(\beta_1)]$ constituting the mechanism (ω_2).

Now I call a following condition as X of the theorem.

X : "When the pivot (α_1) is disposed on a segment $[(\beta_1),(\delta_1)]$, then four segments $[(\beta_1),(\delta_1)]$ and $[(\delta_1),(\alpha_2)]$ and $[(\alpha_2),(\gamma_1)]$ and $[(\gamma_1),(\beta_1)]$ should be disposed on a relationship of four sides constituting as a segment $[(\beta_1),(\alpha_2)]$ intersects the center of a segment $[(\gamma_1),(\delta_1)]$. If they constitute a square, this articulated mechanism would work best."

We can add a new condition in the theorem :

<http://varipon.com/index.php/theorem/>

"When the condition X is satisfied, then

a joint (α_2) constituting a mechanism (ω_2) would be disposed in the same position of a joint (γ_2) constituting a mechanism (ω_1)

and

a joint (γ_1) constituting a mechanism (ω_2) would be disposed in the same position of a (γ_3) constituting a mechanism (ω_1). "

Challenge : the mechanism (ω_2) should be nested to a invisible mechanism (ω_3) (unrecognized)... In other words, animal bodies are linked to something invisible in the nature?

Finally, I specify the length ratio.

When $A > 0$ then

a length of the segment (ω_1) $[(\alpha_1),(\beta_1)]=A*0.5$

a length of the segment (ω_2) $[(\alpha_1),(\beta_1)]\doteq A*0.65$

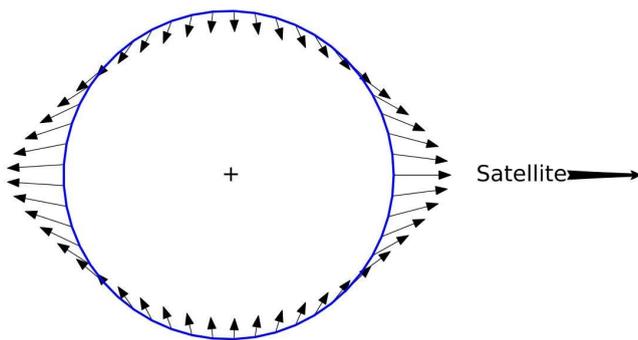
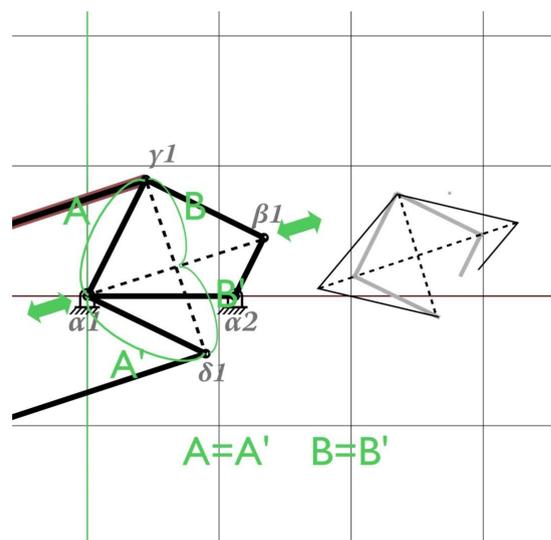
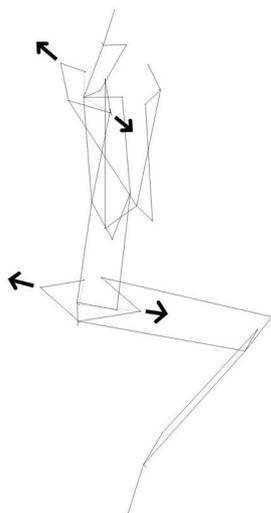
An articulation (β_1) of both mechanisms which is coupled to a fulcrum (α_1) and is disposed so as to be capable of revolving in an orbit centered on the fulcrum (α_1) satisfy the following condition X simultaneously.

Task 6.5 : The diamond rhombus configuration « <https://goo.gl/eSNaF0> »

A diamond structure of the formula has been led from the centreline theory of Chinese martial arts

About the formulas has been led from the theorem of voluntary movement, Françoise Jadot a schoolmistress of mathematics asked me, "Does it have the shape of a square really?" It was a good professional question.

In fact, in order to clearly show out the geometrical shape, I opted for the standard square configuration. However, in order to the physical or mechanical use, I opted for the diamond configuration (diamond Rhombus). Please look at the following initial prototype models. I have opted for the diamond configuration. (see the figure 1,2)



When we walk forward, each square formula of limb can change their shapes for the diamond configuration (diamond Rhombus). I think that is because of the forces due to tidal acceleration, (at a point with respect to a body is obtained by vectorially subtracting the gravitational acceleration at the center of the body (due to the given externally generated field) from

the gravitational acceleration (due to the same field) at the given point. (see the figure 3) : from wikipedia https://en.wikipedia.org/wiki/Tidal_force)

Look below, this is the mechanism of the human run movement. Simulation demo: <https://youtu.be/SQf8IzkgP74>

The formulas of the articulation of the hip and shoulder are deformed for the diamond configuration (diamond Rhombus) (see the figure 1), Voila, this idea is very important for explaining the relationship between the attractive and repulsive forces and its physical implementation (development of animal machine) ..

Our mathematics teacher was using a hard-bitten mathematical method (see the left figure) in order to



find an ideal shape. On the other hand, I arrived to find it unconsciously at the end of trial and error, without using any mathematical technique. That process is mysterious. But the answer is simple. the mechanics of Wing Chun theories has led me.

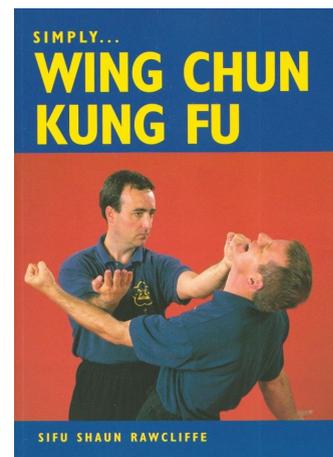
When I studied in the lodge of Sifu Cornelia Gruber the Tai Chi master in the summit of Neuchatel mountains, She encouraged me to read many books of Ip Man's Wing Chun and Bruce Lee's Jeet Kune Do. They reconstructed the hermetic Chinese martial arts as more practically and scientifically. In this time, I was inspired from a following book, "SIMPLY ... WING CHUN KUNG FU - SIFU SHAUN RAWCLIFFE"

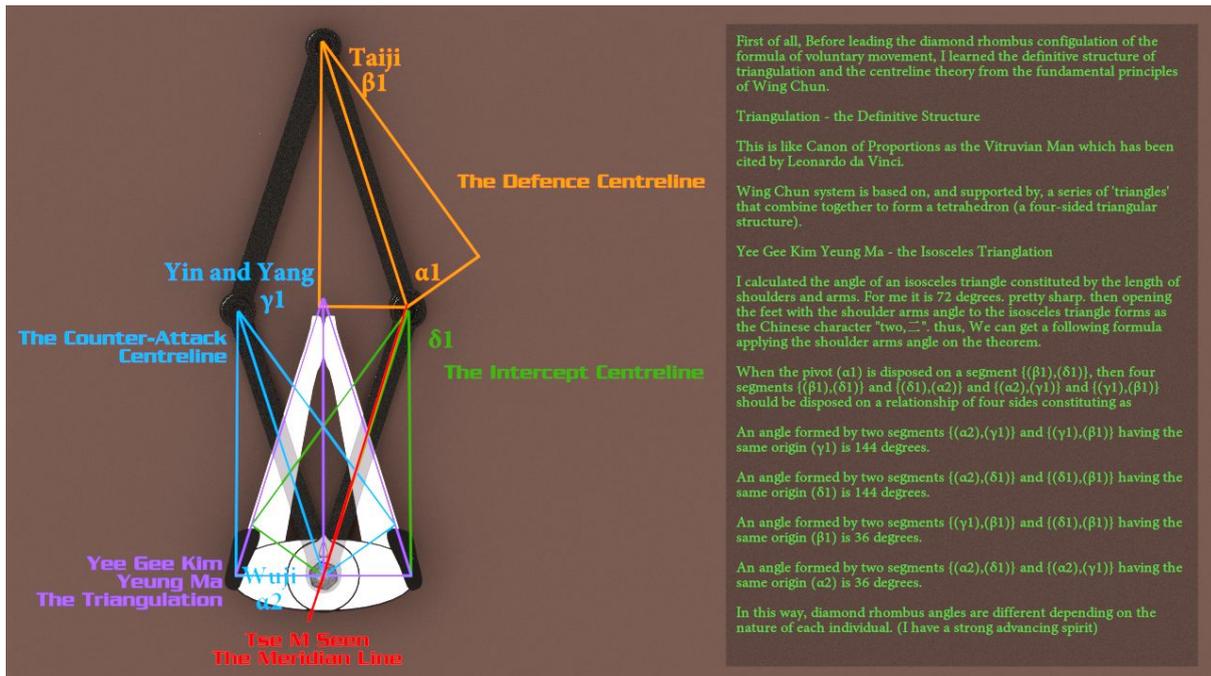
This book is very impressive with that front cover on the three primary colors (red, blue, yellow). The expository of Abstract reasoning and Technical

analysis diagrammatic forms helped me to make a mindset to lead an innovative idea. It has been set in my deep psyche definitively.

That is not all. Master Cornelia made a unique board game. The game title is named "Sifu", while visiting several martial arts masters on a journey, gamers can learn naturally the ancient esoteric symbolic art concepts such as the Yin and Yang, The five elements, Bagua.

So, next time, I will specifically describe about the diamond structure of the formula while excerpting Wing Chun theories. Everyone will be surprised when knew the fact of the formidable laws of the voluntary movement has been hidden in the repeated practice of Kung Fu for everyday.





Task 6.5 : The diamond rhombus configuration « <https://goo.gl/eSNaf0> »

First of all, Before leading the diamond rhombus configuration of the formula of voluntary movement, I learned the definitive structure of triangulation and the centreline theory from the fundamental principles of Wing Chun.

Triangulation - the Definitive Structure

This is like Canon of Proportions as the Vitruvian Man which has been cited by Leonardo da Vinci.

"Wing Chun system is based on, and supported by, a series of 'triangles' that combine together to form a tetrahedron (a four-sided triangular structure)." [1]

Yee Gee Kim Yeung Ma - the Isosceles Triangulation

I calculated the angle of an isosceles triangle constituted by the length of shoulders and arms. For me it is 72 degrees. pretty sharp. then opening the feet with the shoulder arms angle to the isosceles triangle forms as the Chinese character "two, 二". thus, We can get a following formula applying the shoulder arms angle on the theorem.

When the pivot (α_1) is disposed on a segment $\{(\beta_1), (\delta_1)\}$, then four segments $\{(\beta_1), (\delta_1)\}$ and $\{(\delta_1), (\alpha_2)\}$ and $\{(\alpha_2), (\gamma_1)\}$ and $\{(\gamma_1), (\beta_1)\}$ should be disposed on a relationship of four sides constituting as

An angle formed by two segments $\{(\alpha_2), (\gamma_1)\}$ and $\{(\gamma_1), (\beta_1)\}$ having the same origin (γ_1) is 144 degrees.
 An angle formed by two segments $\{(\alpha_2), (\delta_1)\}$ and $\{(\delta_1), (\beta_1)\}$ having the same origin (δ_1) is 144 degrees.
 An angle formed by two segments $\{(\gamma_1), (\beta_1)\}$ and $\{(\delta_1), (\beta_1)\}$ having the same origin (β_1) is 36 degrees.
 An angle formed by two segments $\{(\alpha_2), (\delta_1)\}$ and $\{(\alpha_2), (\gamma_1)\}$ having the same origin (α_2) is 36 degrees.

In this way, diamond rhombus angles are different depending on the nature of each individual. (I have a strong advancing spirit)

[1] SIMPLY ... WING CHUN KUNG FU - SIFU SHAUN RAWCLIFFE



Fundamental Principles

Jic Seen (Straight Line) : It is an imaginary line running vertically through the centre of the body, functions as a rotational axis.

Tse M Seen (Meridian Line) : It can be considered as a centreline plane that radiates out from the Jic Seen in all directions and is defined as the line that joins the Jic Seen of the attacker to that of the defender. It is line (plane) that a Wing Chun exponent will always dominate, defend and counter-attack.

When adapting the diamond rhombus configuration of the formula of voluntary movement to the Wing Chun centreline theory, the following relationship is derived.

A fulcrum (α_1) : Jic Seen (Straight Line) of an attacker.

A joint (β_1) : It is coupled to a fulcrum (α_1) and is disposed so as to be capable of revolving in an orbit centered on the fulcrum (α_1). It is equivalent as the Taiji 太極 "supreme ultimate".

A segment $\{(\alpha_1), (\beta_1)\}$: The defence centreline. It's a path that the attacker's limb travels towards the defender like that the joint (β_1) which aiming a fulcrum (α_2).

A fulcrum (α_2) : Jic Seen (Straight Line) of a defender (Kung Fu practitioner). It is equivalent as the Wújí 無極 "limitless; infinite".

A joint (γ_1) : A joint (δ_1) : These are disposed so as to be capable of revolving in an orbit centered on the fulcrum (α_2) so as to maintain a constant mutual positional relationship with each other. Also Wooden dummy has two centrelines to the left side and right side at the upper-body triangulation.

A segment $\{(\alpha_1), (\alpha_2)\}$: Tse M Seen (Meridian Line). The fulcrum (α_2) is disposed so as to maintain a constant mutual positional relationship with the fulcrum (α_1).

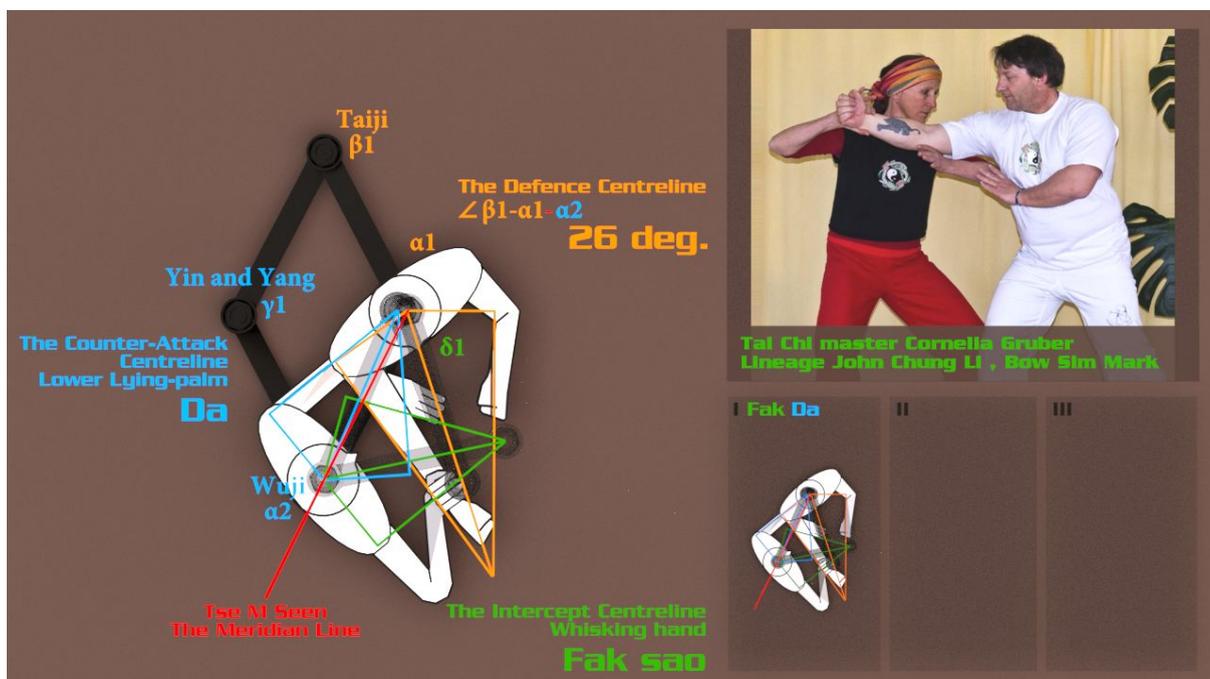
A segment $\{(y_1),(\alpha_2)\}$: The counter-attack centreline. It's a path that the defender's counter strike will travel and control like that aiming the segment $\{(\alpha_1),(\alpha_2)\}$.

In this way, there are two centreline planes active at the same time: the defence centreline and the counter-attack centreline. Wing Chun practitioner is facing his opponent's centreline, but his opponent's centreline is not directly facing him. That is called "Centreline advantage".

A segment $\{(\delta_1),(\alpha_2)\}$: The intercept centreline (New definition). It intersects the segment $\{(\alpha_1),(\beta_1)\}$. While intercepting the defence centreline, the defender induces the defence centreline to take the orbit like an arc. then the counter-attack centreline approach to the segment $\{(\alpha_1),(\alpha_2)\}$, Tse M Seen.



Reference :
SIMPLY ... WING
CHUN KUNG FU
- SIFU SHAUN
RAWCLIFFE



Fak Da - Whisking & Lower Lying-palm hit

Tai Chi master Cornelia Gruber; Lineage John Chung Li , Bow Sim Mark

School of Tai-Chi Chuan Cornelia Gruber-Bilgeri <http://www.taichichuan-cornelia.com/en/>

The Taijiquan & Qi Gong Federation For Europe <https://www.facebook.com/groups/854929414638845/>

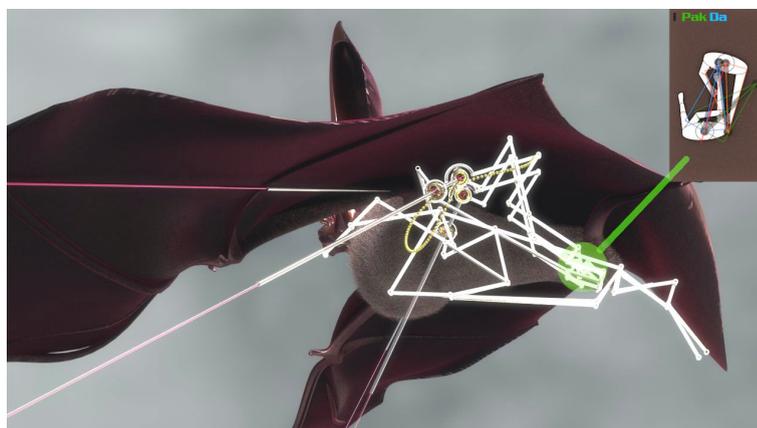
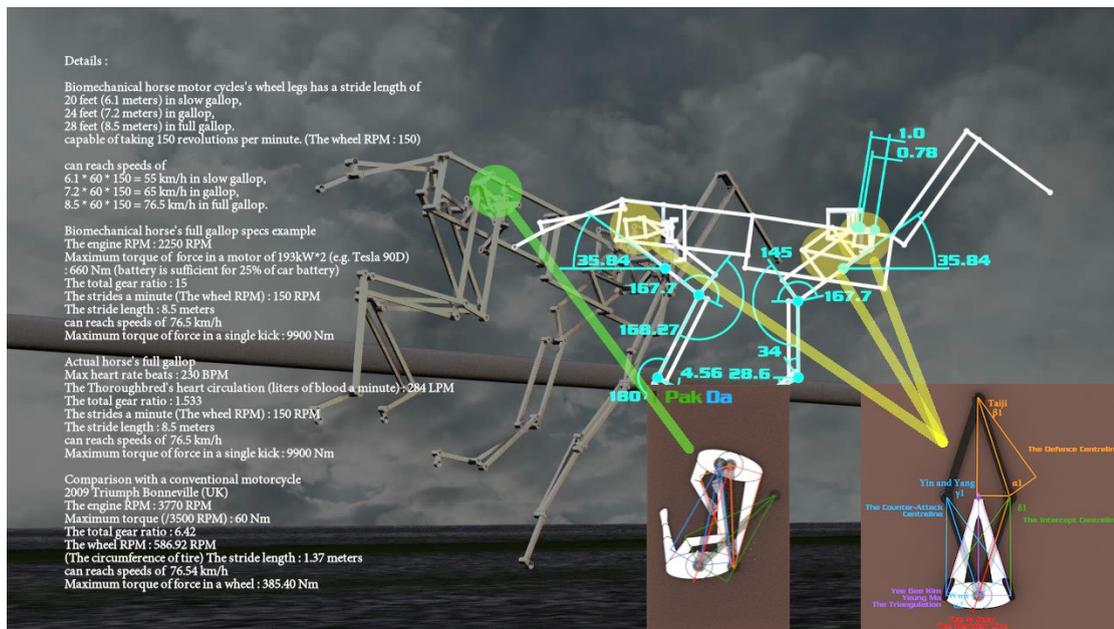
Bow Sim Mark Tai Chi Arts Association

<https://www.facebook.com/Bow-Sim-Mark-Tai-Chi-Arts-Association-114431485311811/>

As I've introduced until now, I made an invention of the universal biomechanical element from the centreline theory of Chinese martial arts such as Wing Chun Kung Fu. starting from there, I derived the formula of voluntary movement. In other words, this formula governs any movement of animal in the nature!

When a horse is galloping, in order to move a leg of the horse, two warriors are fighting in the interior of the hip of the horse! At the moment in a single kick of the horse generating a force torque 9900 Nm, in the formula in the hip joint, one Kung Fu defender exercises the counter-attack. In the same way, in order to move a wing of a bat, warriors are fighting in the interior of the shoulder of the bat! **They are supposed to fight a duel continuously in order to move forward.**

So, we can say that Kung Fu is the art of progress. as well as, two warriors are always necessary as fulcrums for the sustainability mechanism. therefore we shall stop fighting to respect each others. In this way, Kung Fu practitioners can feel that is a metaphor of the internal mechanism of voluntary movement of every living thing matters.



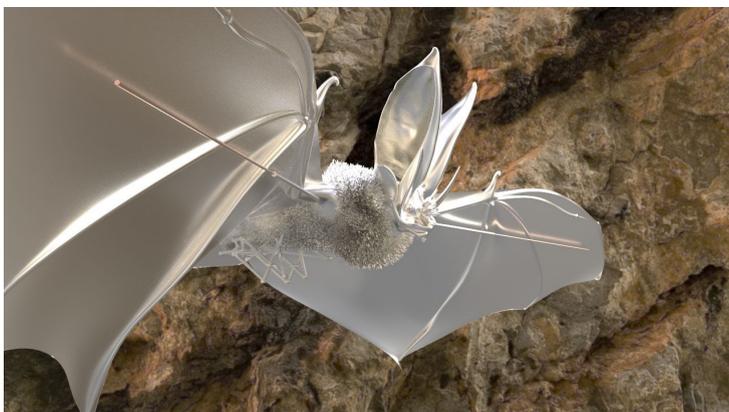
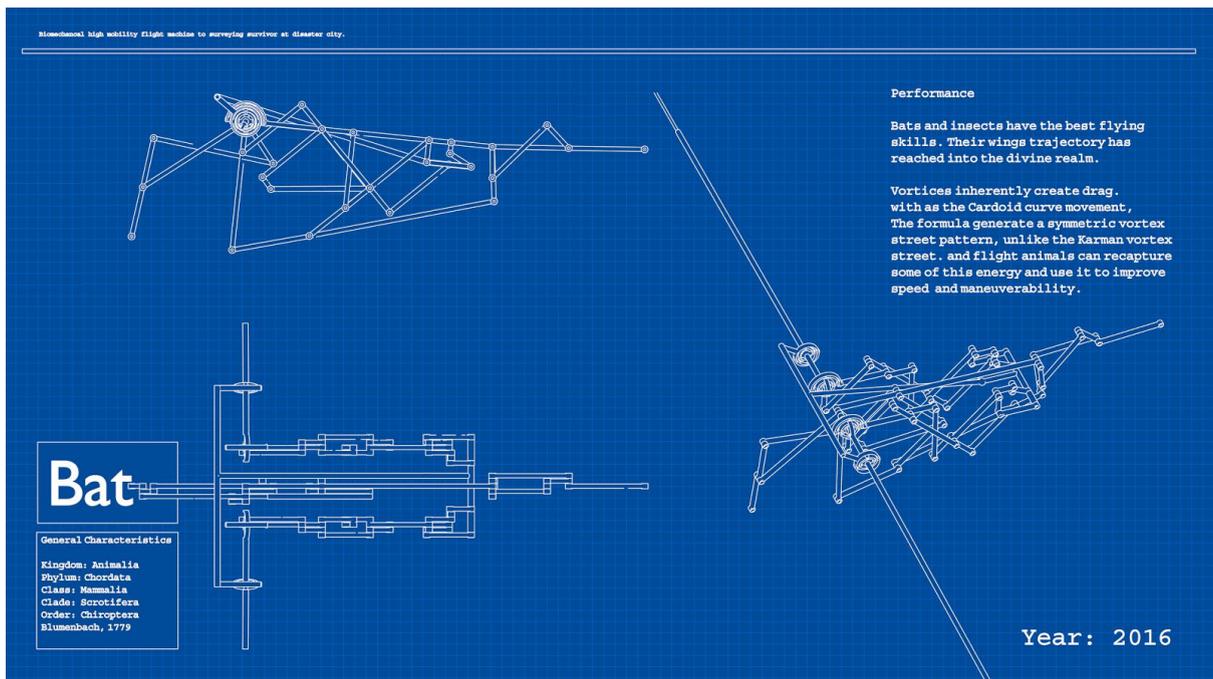
Work Plan 9. Biomechanical simulation of animals flights (definitive edition)

« <http://varipon.com/index.php/work-plan-9/> »

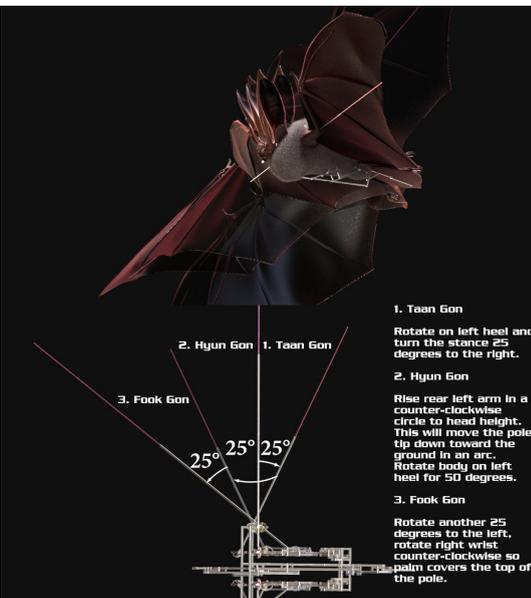
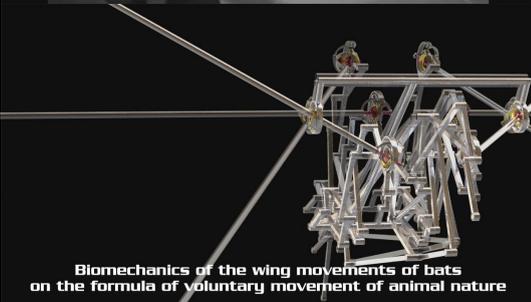
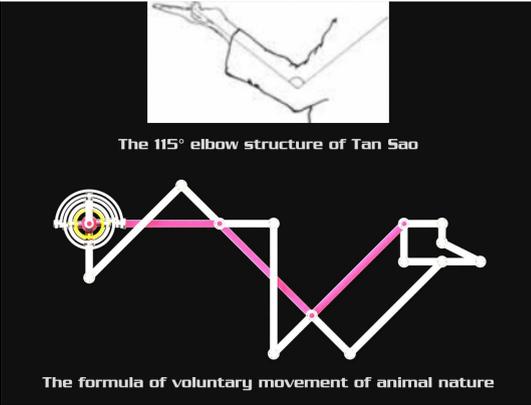
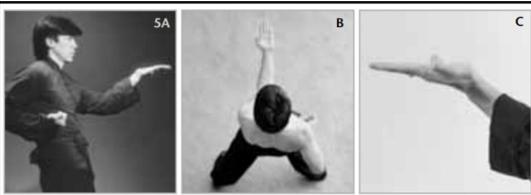
Task 9.3 : Bats and Divine formula :

« <http://varipon.com/index.php/work-plan-9/task-94-bats-and-divine-formula/> »

« <https://goo.gl/PJyFI> , <https://goo.gl/JfwMnc> , <https://vimeo.com/152264330> »



BLUEPRINT OF BIOMECHANICAL BAT



Next generation innovations needs international collaboration and the diffusion of knowledge across borders.

As an example to prove it, I've clarified many biomechanical movement structure of nature animal at a very short time. In the background, there is a support of chinese martial art that I've learned. Wing Chun Kung Fu is efficient and lightning fast internal martial arts.

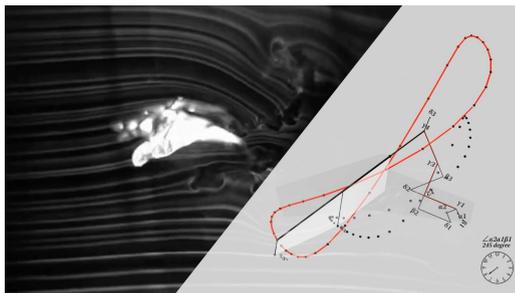
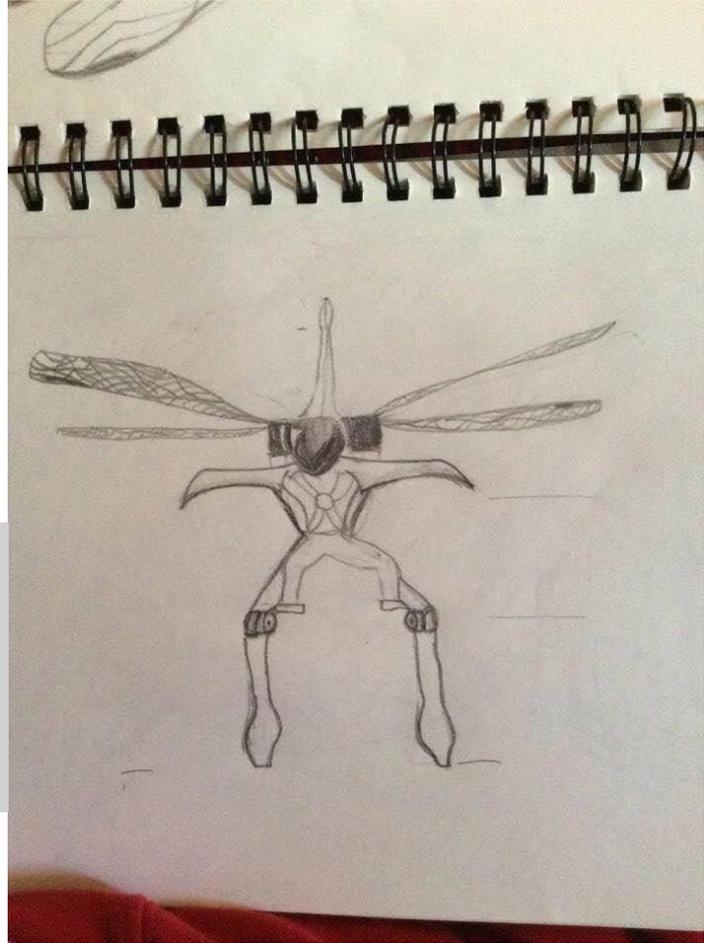
Conventional creating method took long time to produce a practical mechanical structure. On the other hand, from the Wing Chun system's forms sequence and minimalism concept that is set in the deep consciousness of my neural net, I invented a theorem of voluntary movements of animal bodies and a universal biomechanical link mechanism. As a result, I already achieved a progress of 100 years' worth.

I can present to WIPO some examples of how my own neural net was taking advantage of Wing Chun system. (Please refer to the accompanying drawings.) I also represent the thanks to the Chinese beautiful and magnificent culture.

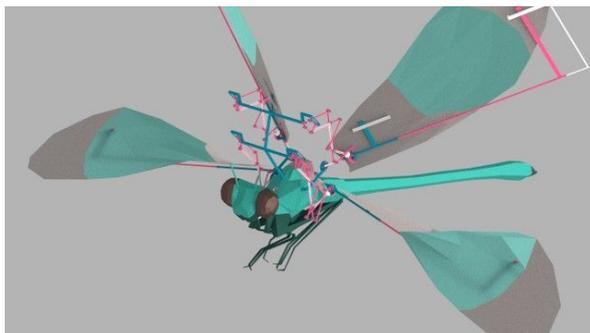
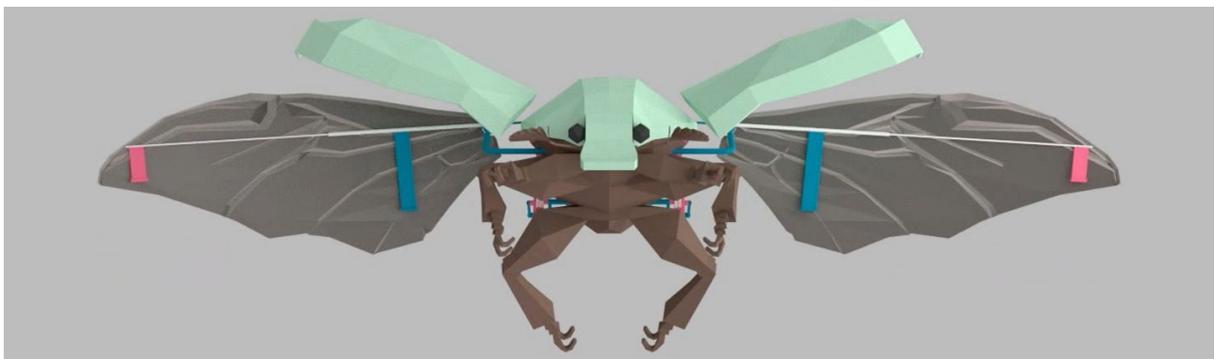
"At the national level, the report says that innovation policies should more explicitly favor international collaboration and the diffusion of knowledge across borders. New international governance structures should also aim to increase technology diffusion to and among developing countries." - Global Innovation Index 2016

Jesua Rivera who like Tony Stark of Iron Man, he was interested in my invention and he show me his image dessin of the future airplane.

Young people who having a playful mind are thinking seriously.



Task 9.1 : Drone beetles
« <https://goo.gl/pjws8C> ,
<https://goo.gl/oM4k10> »



Task 9.2 : Dragonflies « <https://goo.gl/A0vR4X> »
Dragonfly's characteristic hind wing and fore wing are not same movements. Even in this case, the formula of voluntary movement is always valid. That is, by changing the position interrelationship of the fulcrum and the effort point, I confirmed two wings movements can be realised. I was relieved to this result. in the Formula, we can found a philosophy to become the keys of swarm intelligence.

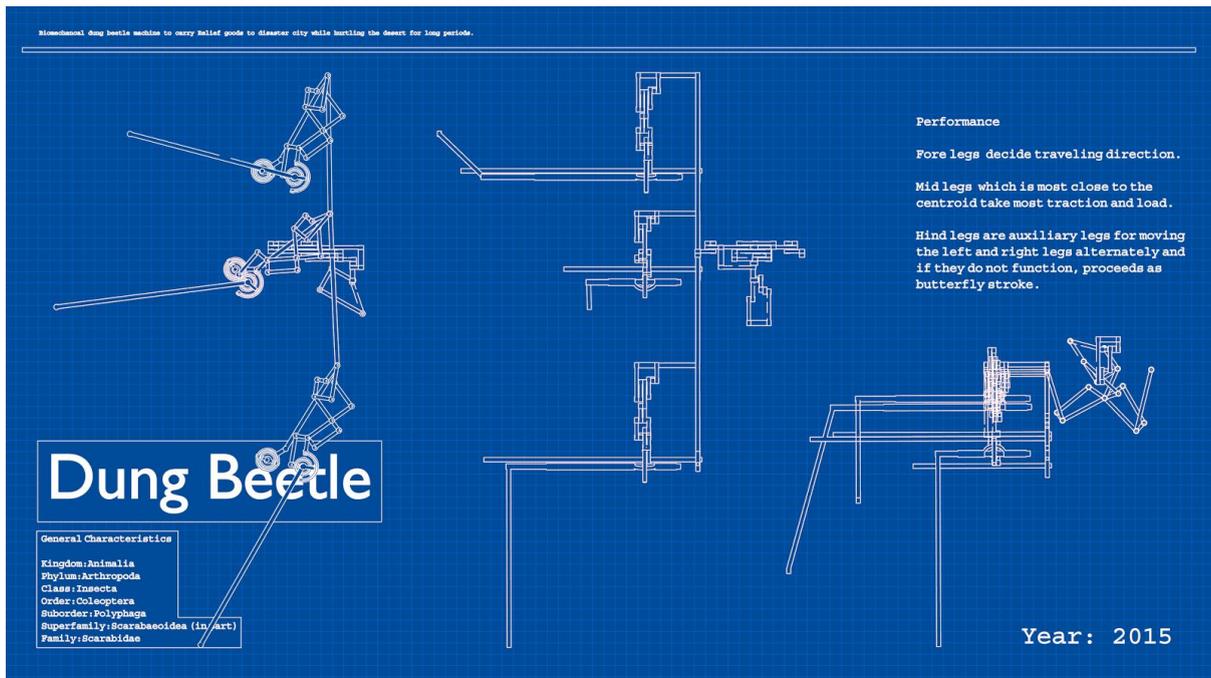
Work Plan 3. Biomechanical simulation of multi legs

« <http://varipon.com/index.php/work-plan-3/> »

Task 3.3 : Dung beetle running

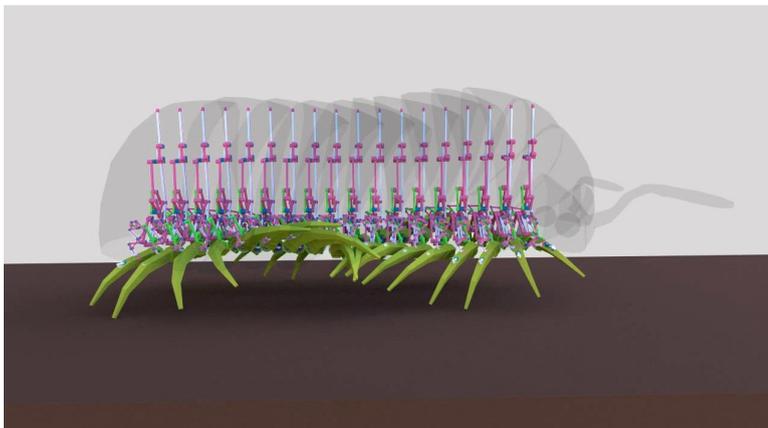
« <http://varipon.com/index.php/work-plan-3/task-33-dung-beetle-running/> »

« <https://vimeo.com/146872666>, <https://goo.gl/1uoigc> »



BLUEPRINT OF BIOMECHANICAL DUNG BEETLE

Task 3.4 : Millipede walking « <https://goo.gl/qaPn5P> »



Work Plan 7. Biomechanical simulation of serpents

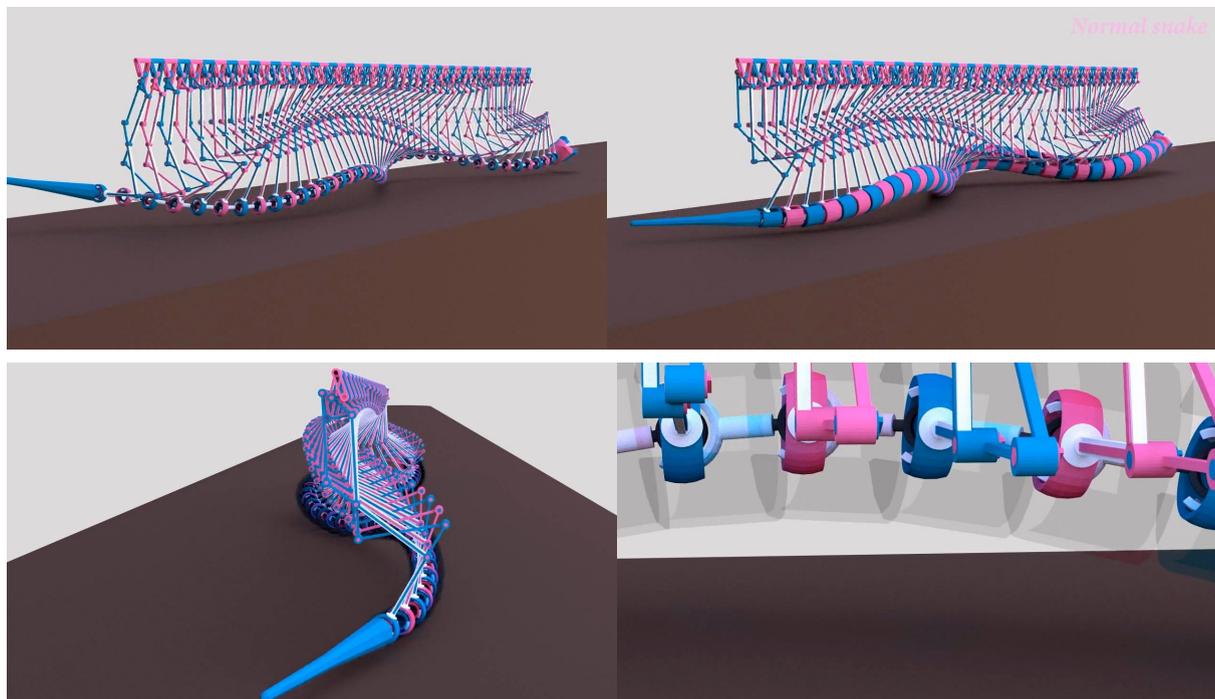
Task 7.1 : Serpent crawling « <https://goo.gl/ILeVFf>, <https://goo.gl/ySLzpg> »

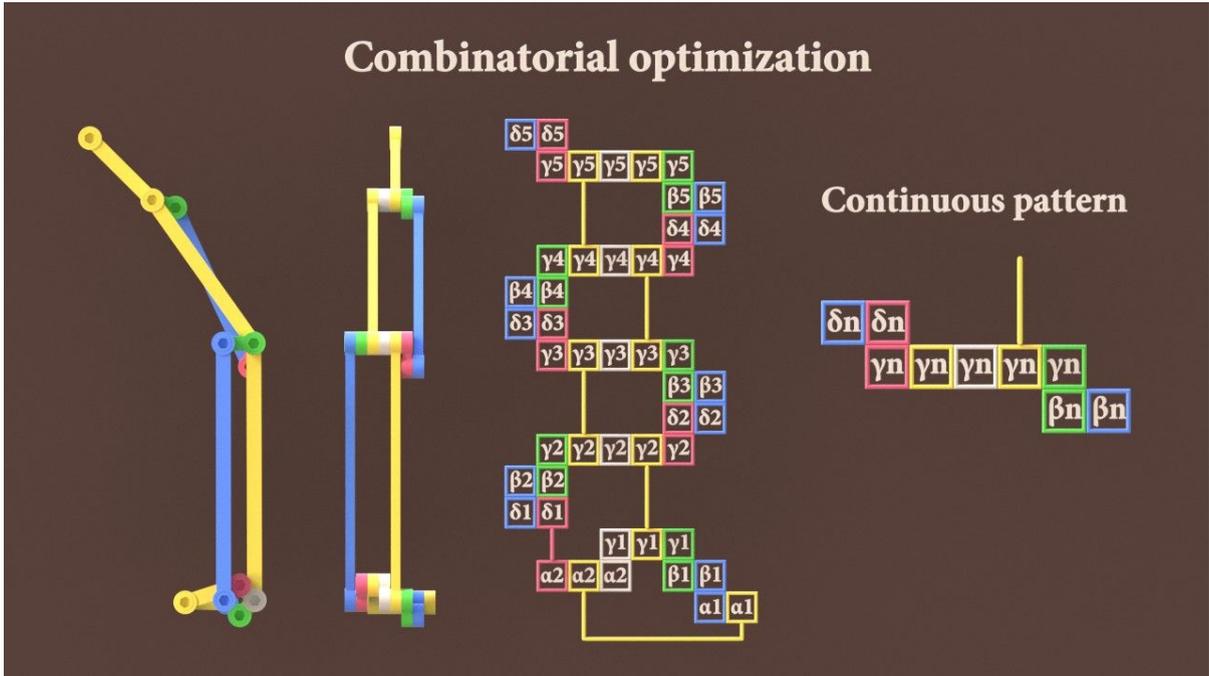
The fins of manta ray, the wings of insects, etc. There is no bones articulations in them. there are some voluntary movements who cannot show his biomechanical kinetic structure. In this case, we can concentrate on the path curve of the tip of movement. in the summer of 2013, I found that the trajectory of the figure eight gives the voluntary movement of the body of snakes. with the same concept, I also understand the mechanism of the fins of manta ray.

In 2005 I was strongly encouraged to study well by watching the promotional videos produced by François Junod, the master of automata produtor, in Sainte-Croix. I made some research about one of his masterpieces, which is the flying carpet (also referred to as a magic carpet) and the Arab caliph (king). It was one of the main pieces of his work. « <https://youtu.be/hm9G8Lo8V4Q> »

Then, I found a logical order in the sinusoid wave. There are similar kinds of mechanism that are arranged in parallel when their phases shift. ... Then at the cafe of Pompidou center in Paris when I made two shot glasses roll horizontally, I found that to create a crawling snake figure, I could draw a trajectory figure in shape of the number eight, which can also represent infinity. The trajectory of the number eight also appears in Chinese martial arts that imitate the movements of natural animals. Please see below for the details of the trajectory of the formula. « <http://goo.gl/bKevoS> »

I furthered my research on basic mechanical linkage to draw the trajectory of the figure eight. This mechanical linkage basis, which has fine proportions, can be expressed with geometric shapes, the combination of a square and a parallelogram, two isosceles and orthogonal triangles, and an isosceles right triangle. This trajectory of the figure eight is in flat shape. There is a circle on the left and another on the right, and they are slightly different from each other. One end is pointed and the other end is rounded.





Combinatorial optimization

I solved a horizontal joint combinatorial problem that I had been thinking since 2014.

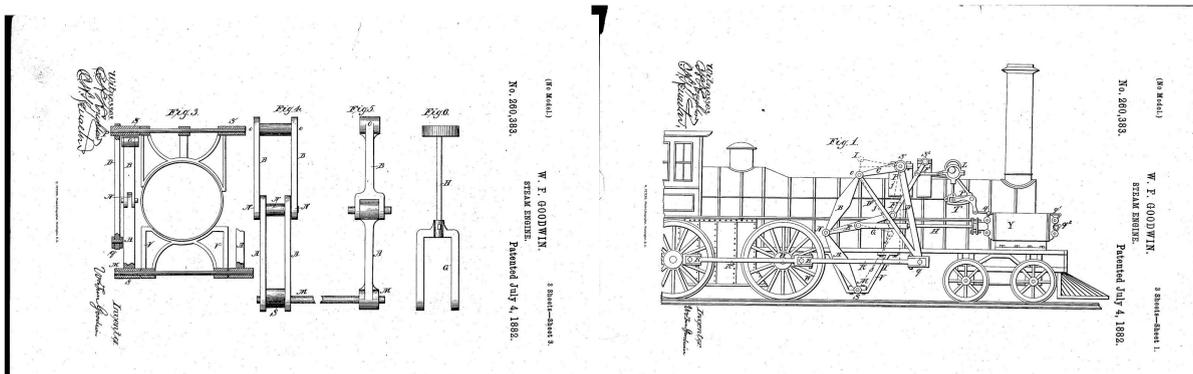
I carefully observed in the artwork of a locomotive mechanist pioneer of United States of America, William Farr Goodwin who invented a mechanical horse in 1867 Jan 22.

<https://research.archives.gov/id/594926>

As a result, he has suggested me to be symmetry about joint combinations.

In this way, I discovered a continuous linking pattern to the left and right infinitely like serpentine meandering or DNA spiral. Only for the first time, there is an exceptional combination due to a fulcrum(α_1) and a fulcrum(α_2).

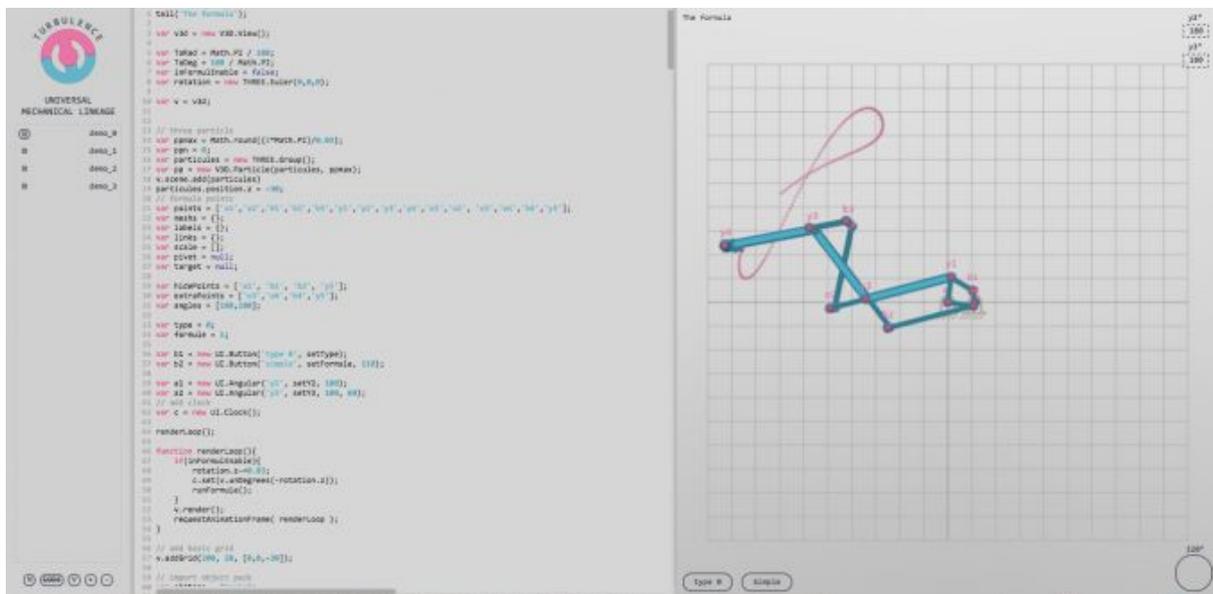
It was very difficult to solve this problem. There will be other patterns as well.



Work Plan 10. Simulator

Task 10.1 : Lo-Th 's WebGL simulator "Turbulence"

« <http://goo.gl/MShsfy> , <https://github.com/varipon/Turbulence> »



My major business fellow is WebGL's top programmer as well as 3D generalist. (I'm also 3D generalist.)

« <http://lo-th.github.io/Avatar.lab/> »

« <http://lo-th.github.io/olymp/> »

I experimentally developed a web simulator on GitHub with him. I plan to develop in the future that Web application for interactive simulation or representation of the perceptual model with human-computer interaction. It is useful for client to product design customization.