

Knowing Yourself

Yevgeniya KOVALCHUK^{a,1}

^a*School of Computer Science and Electronic Engineering,
University of Essex, Wivenhoe Park, Colchester, CO4 3SQ, UK*

Abstract. The paper discusses the concept of energy, its transformation, and transmission. Any physical object, event, word, sound, thought or even money is seen as a bundle of energy. This is a fictional story suggesting direction of technological/scientific development in the future.

Keywords. Bundle of energy, energy flow, intelligent environments, data mining.

Introduction

Technological development could be both destructive and constructive. With the construction in mind, many modern technologies can be used to improve humans' well-being and their performance. The space, the environment we live in, should encourage understanding of ourselves and realizing our potential. Can we build our intelligent homes not only with the idea of assisting us with our everyday routines, but also help us to reveal our talents, inspire, and aid our improvement and development? Similar to the Feng shui concept, can we scientifically derive the ways in which our personal interior should be designed? Our talents and objects around us are colors on our pallet; it is up to us how we mix them. Even black-and-white can be interesting: a moving shadow on a white wall can create dynamic pictures that tell stories. Limits exist only in our minds. Technology should help us see a broader picture. Living life is like solving the knapsack problem [3]: it is limited and we want to maximize the total value of experiences we fit into it.

But we all have unique lives: we develop our personal set of values, define individual goals, and choose our own means of achieving them. We treat things differently. For example, a doctor sees the heart as the organ pumping blood and delivering nutrients to the cells; he looks for deviations in QRS complexes. Many people do not notice their heart. They only become aware of it when they feel it jumps out of their chest when getting scared or excited over something. The heart also symbolizes love. Everything has a different meaning depending on its possessor. Equally, we seem to respond to various stimuli in our personal way. How to find those drivers that work for us individually?

Reflecting on which things inspire people, the question is, what energy arises. The existing approach to calculating energy consumption and expenditure by humans is quite limited as it fails to explain deviations in our performance and productivity in similar settings of the same working environment. In particular, this approach does not

¹ Corresponding Author. Email: yvkova@essex.ac.uk

count for emotions. How can we measure different types of energy and transform it from one form into another?

The fiction story told in the following section further develops and discusses the above ideas and questions putting them into the context of real world scenarios. Second section discusses the latest achievements in science and technology which could assist in addressing the issues. The later section also suggests directions for further technological development.

1. A Story of Transformation of Energy

1.1. A Bracelet

“I have no energy left for the Spanish lesson tonight” – Kate thought throwing her body on a bench. The landing was really heavy confirming Kate’s tiredness. It was also unexpected which scared a cat resting at the other end of the bench. The poor animal instinctively jumped off the bench and ran away. Being stressed, it completely lost its mind and found itself on a road. The squeak of brakes filled the air – the reaction of the driver was fast, but not that of the one behind. A small touch, but the drivers decided it was worth holding up the traffic while they argued about the accident. The Spanish teacher didn’t know the reason why the bus was late. But knowing it wouldn’t have changed the fact that he was severely late and had to cancel the class – Kate felt the relief reading her teacher’s text.

“Right, what shall I do tonight?” – Decision-making never was the strongest part of Kate’s personality. Actually, she could never understand that word combination. ‘Gather and analyze data’, ‘Prioritize’, ‘List pros and cons’ ‘Make informed decisions’, ‘Plan’, ‘Predict’ – she was taught at the University when studying Management. “How can you actually plan when people do not commit to their obligations?!” – Kate was now angry with her teacher because he ruined her plans. Such is the nature of women: they never know what they want. At least that was what Kate usually heard from Alex, her boyfriend. He always got frustrated when she was changing her mind. Personally Kate referred those changes to the ability to react to circumstances in real time as opposed to sticking to plans. So far, their mutual life had not brought any evidence in support of either concept: sometimes, following an initial plan made their lives easier; in other cases, they were rewarded for taking spontaneous decisions.

- Hey, I have finished for today, could we meet earlier? – Kate called her lovely one.
- Sorry, have to finish a report, but will be with you in two hours. You could go shopping to kill the time.

“To kill the time, hmm” – Kate mimic her boyfriend – “It is my bread, if you like!” Alex knew her very well. Kate liked to explore showcases and trying on new things: clothes, jewelry, perfumes, food etc. They transformed her physical appearance and effected her sensation. She enjoyed imagining alternative lifestyles for herself and listening to the information such changes was bringing her. One could think of it as a waste of time, but she found it to be the best way to relax after busy working day. Such experiences were always very productive, inspiring, and stimulating.

Kate often took journeys to big stores watching people buying stuff they don't need. She liked to collect snatches of phrases heard from passers-by; various bits of information usually came along together very nicely to construct a story which served as a food for her brain. She loved to wonder streets observing others. She always tried to guess the meaning people put into their actions. For instance, if she were to see a man washing his car, she would wonder why he did so. Was it simply because his car was dirty? Was he resting from another activity? Was he running away from disturbing thoughts? Was he delaying other things he had to do (Kate found procrastination was a common sin among people)? Was it about prestige or to acquire respectful feeling about himself? Kate could only guess. But with the time, she had developed the skill of understanding and predicting people's behavior in the very first moment of knowing them. Her boyfriend was sometimes scared of her ability to 'read his mind'. But there was no magic, just the experience of knowing people she gained through her job. Kate managed a small bookshop (the business inherited from her father), and she knew all her customers personally.

Kate loved her business. It was like her child; she devoted most of her time to the shop. Once hooked, customers were coming to her again as they knew she would find for them that rare books which they could not pick up from bigger stores. She knew the literature indeed; she was an excellent judge of advanced books. Ironically however, she doubted the power of the word itself. She found languages were too narrow and rough to express all the variety of life. She believed that all senses should be engaged in order to get fully involved in a story and understand the message it brought. A word, a sound, a picture, a movement, a smell, taste, and touch – they all contribute to building up a greater experience. Personally, she preferred to express herself by drawing pictures. Art could express ideas in more accurate and laconic way, she thought. She put her drawings into the showcase of her shop – she found that was the best way to attract eyes of passers-by. But she never took her hobby seriously.

A nice bracelet, hanging along with some others on a wall of a jewelry shop, attracted Kate's eyes. Hundreds of triangles of different sizes, colors, and materials were interlaced together in various patterns. It was so simple and so complicated at the same time. It seemed the whole eternity had passed until Kate could identify herself in the reality again. She could not grasp what was that exactly in that bracelet which caused her to be lost in space, but she felt exactly: that was a resource of positive energy. Kate believed that physical objects had the ability to provide us with, as well as take away our energy. She could never define or explain what that energy was for her. She could only notice that sometimes she felt like she could conquer the world doing her work easily with uplift mood, while she felt depressed losing everything from her hands on another occasions.

Looking at the bracelet she recalled her friend Charlotte. "This one will definitely suit her; I should buy this bracelet for her!" A price does not matter sometimes as it does not represent the actual value of a product it could bring to its owner. Kate knew that: she could imagine, for example, a girl buying cheap shoes. A broken heel could lead to missing an important meeting and losing the job as a result. At the same time, it could prevent from being involved in an accident happened further down the road in a few moments later. The shoes could be equally shelved and never used. Similarly, a music track could remind someone of a certain event and thus meaning a lot to that person. For another person it could be just yet another tune.

Kate felt Charlotte would appreciate the present.

1.2. Fire

It was another hour to go before meeting Alex. Tired from the crowd on the main street, Kate turned her steps into a park lying nearby. It was a nice summer day. Breathing fresh air, observing nature, listening to the wind, catching the last beams of the sun – Kate could feel the energy coming back to her. She could spend ages recharging her batteries in that way. A passer by smiled to her. Kate's mouth smiled in response. It is amazing how easily a good mood could be transferred in the space.

A group of men were dancing around a fire. A few more were playing drums setting up the rhythm. Kate came closer. She set by the fire getting herself involved into that magic process of transformation of wood into heat. The tongues of the flame were calming, warming, and dangerous at the same time. They were wild, unpredictable and out of control, but also homely and welcoming. They reminded Kate that life was always like a battle between the fear and curiosity.

- Energizing? – one of the drummers stopped playing and set next to Kate.
- Yes, you are right! Music, dance, and fire – all makes me feel good. Seems my tiredness disappears gradually.
- Hard day?
- Not really, nothing different from my typical working day, but I just feel exhausted for some reason; I don't even understand why!
- What do you do?
- I run a small book store, basically doing everything myself, including servicing customers.
- Maybe there was an annoying customer visiting you today who upset you?
- No, I can't remember anyone. I know most of the customers and maintain very good, I would say friendly, relationships with them. For example, there was one woman today who brought me flowers, daffodils, to thank me for the last book I have got her. That was a really tough one to get.
- Do you know that daffodils could cause allergy reaction in some people?
- Do they? No, I didn't know that. This could explain the head ache I have; I don't normally suffer from headaches or general weakness. I would have never thought that flowers could have such a strong impact on human's health.
- Everything around us influences us in a certain way. Nature, weather, music, odors, physical objects, other people's behavior, thoughts, and actions – everything is interconnected and interdependent. We are children of the one information field, but only perceive the data to the extent we are happy and ready to digest and accept. If you don't see something it doesn't necessarily mean it doesn't exist, doesn't notice you, or have no impact on you. Your every day being virtually similar to many others is still unique. That is what makes us different from machines – we have more complex senses and thus react to changes in the environment in a more sophisticated (often unpredictable) way.
- I am not sure I would agree, but it could explain why I left my work exhausted thinking that I would have no energy for a Spanish lesson that was scheduled for tonight. Luckily, my teacher seemed to hear my thoughts as he has just canceled the lesson.
- Be careful, thoughts materialize!
- What do you mean?

- I mean, the way you think and act changes the reality.
- If so, why I still not a famous artist then?! – Kate teased the stranger.
- Because you only dream about it without taking any actions. You won't achieve anything in this life without clear intention. Sit and imagine the clear picture of what and how you want to achieve. Keep the plan in your mind. It has to run at your subconscious level: you set up a timer, and while you are doing your daily routines the mechanism works at the background until Boom! – all your thoughts and efforts come together to make your intention to become reality.
- Hold on, I have already heard this story a while ago. “Cinderella” – that is how it was called! Come on, it is real life, not a fairy tale! I cannot rely on a magic wand.
- Of course you can, it is just the fear that stops you.
- Ok, I will try, but only to prove that you are wrong!

Joking apart, Kate took it seriously this time. She knew that belief was a key to success here.

- Will see you in a bit! – Alex was rushing to his girlfriend.

1.3. Miracles of Nature

Kate could not fall asleep last night thinking about all her yesterday's experiences: about the complexity of connections of all things in the universe, about different sources of energies and their transformations, about the impact energy flows had on people and inability of humans to perceive many of them. She thought about power of a thought and imagination, and the need for clear intention.

The first thing Kate did today was watering roses her boyfriend gave her yesterday instead of the daffodils. The odor and beauty of the roses and the fact they were from the loved one definitely set up the day positively.

Kate took out the bracelet she bought for Charlotte yesterday. It was definitely her friend's thing. “But how did it work?” – Kate wondered. “What is that special about this adornment?”

The bracelet reminded Kate that it had been two weeks already since she spoke to Charlotte last time. Normally they met to share their news at least once a week. Kate was about to call her friend as the phone rang itself.

- Do you have time tonight? I need to show you something – that happened to Kate often: she had only to think about her friend, as Charlotte turned up herself.
- Yes, sure, will come to yours after work.
- Brilliant!

Apparently that had been the flowers which had made Kate felt unwell yesterday. She felt great today. Actually she felt far too well, as something good was about to

happen. Kate noted the feeling, but did not pay that much attention to it. She was impatient to hear Charlotte's news and find out her reaction to the bracelet.

- I have got something for you! – announced Kate accepting a cup of green tea with strawberries and cornflowers from her friend's hands. Charlotte was an expert in teas and was treating Kate with the most interesting ones. She knew Kate was always up for new experiences.
- What is that?

Kate gave her friend the bracelet. She predicted Charlotte would like the present, but she couldn't expect such enthusiastic reaction.

- Wow, that is the thing! It is so reach, and I cannot believe these are triangles!
- What? What is that special about the triangles? – Kate was really confused.

Charlotte disappeared for a moment coming back with a small parcel. She unwrapped it revealing small brown stones in an isosceles triangle shape, which created unbelievable beauty.

- These were part of me, salt stones from my kidneys; I had an operation yesterday. Your bracelet made me to understand why I have never been tempted to buy jewelry in the shape of triangles so far, only circles or squares: the later were needed to balance the natural triangles I have gained through my lifestyle. I think our actions and deeds, artifacts, jewelry, and decorations are there to balance flows happening inside us. What do you think?
- Well, it could explain my spontaneous decision to buy you the bracelet. Did you say you had the operation yesterday? That is when I came across the bracelet and thought about you.
- Yes, thank you, I really like this thing! It feels like my style now. It might be a perfect resource of energy for me to recover after the operation quickly! I believe there is a huge potential for increasing our power by using physical objects which suit us. But first we need to get to know ourselves to identify what is missing. If we were to better know our preferences, strengths and weaknesses then we could achieve better performance and results, I think.

Kate recall yesterday's conversation by the fire. Indeed, it seemed like there were objects or people around us which provided us with extra energy lifting our mood up; at the same time, there were ones that took our energy away making us feel weak.

- Would you like another cup of tea? – Charlotte knew when to stop Kate's deliberation before she became crazy. It seemed like material objects and daily routines were there to keep us attached to the physical world, otherwise madness would become the common disease among humans.
- Yes please, I think I need one! – Kate examined the stones again. Was it possible that something like that of proper shape had formed in someone's body? Only her extraordinary friend Charlotte was capable for that!

Charlotte filled up the kettle. The sound of running water washed away Kate's weird thoughts. She loved water. It was a sanitarian, a perfect facilitator for rebooting her brain and cleaning up her energy currents.

The smell of hot chocolate and cinnamon immediately brought a sense of winter; expectations of Christmas: security, comfort, and miracle. Kate always wondered how easily her friend could set up a new atmosphere. Just with a pot of tea!

1.4. Art therapy

Kate was not going to her shop again that night. But after leaving Charlotte's place, she thought reading a light book would help to organize her thoughts.

Kate entered the room packed with hundreds of books. What should she read? It was amazing how many memories, ideas, and people's lives could be accumulated in one place. There was a mixture of fantasy and facts. It would be interesting to track human's development: what people had been dreaming about and what the reality was after. What did inspire people for great inventions: was it a society necessity, or personal needs of inventors, or just luck? Were there any similarities between famous people who made significant impact on the course of the history? All of them seemed to have some features in their character that were required to resolve a certain situation at the time. Why did some people leave this world unnoticed? Would we be able to predict the future by simply data mining the historical records made over centuries? What we call intuition might be just an ability to analyze history and read information in real time.

The door bell once again saved Kate from loosing the ground under her feet. She rushed to the door to see who her savior was this time.

- Hello! Sorry for bursting in so late. I have noticed the lights are still on – A young man pronounced with a pleased and sincere smile on his face. His eyes shined. He looked very smart; his suit was both very simple and original at the same time. All in all, Kate felt she liked the stranger.
- It is not a problem at all, you are welcome! How can I help you? – Kate smiled back.
- I have just noticed some drawing in the showcase and could not believe my luck! That is exactly what I need! I organize a workshop on art therapy and these drawings are the perfect material to work with.
- Sorry for my ignorance, what is art therapy? – Kate liked that interesting word combination.
- It is one of the techniques in psychology when you use different art materials and creative processes to achieve certain therapeutic goals. For example, art could help to increase a person's cognitive abilities and judgment, help him to cope better with stress, or establish better relationships with family and friends. Art therapy is also the way to express yourself and to learn how to enjoy the life-affirming pleasures of the creative experience. Different art products, like drawings and paintings, could be helpful in communicating issues, emotions, and conflicts. People would be less stressed if they were to express themselves in a creative manner, I believe.
- I see. And what is that special about the drawings in the showcase?

- They combine shapes in a very original way, I find. Without outlining physical objects familiar to people they provide structure and direction. They fire the sense of dynamics. Combinations of colors are gentle and inspiring at the same time. That is all what many people need to encourage them to make first steps in a new direction. People are normally afraid of changes. They require something to rely on. These drawings seem to provide a support.

Kate was very pleased to hear such a positive feedback. She could never think of her work in that way. She just liked to draw.

- I wonder if I could buy the paintings and where I can get more of them by the same hand. Do you know who the artist is?
- Actually I do, as I drew them – Kate could not hide her pride.
- Are you serious? What a wonderful day! I just cannot believe my luck! – The gentleman seems to be seriously excited. – Would you like to collaborate, as I really think there is a potential in your drawings.
- Oh, thank you! – Kate was shining – I would be more than happy to get involved. I think I have more to say with my paintbrush.
- Brilliant! I am Stuart, by the way – declared the man stretching out his hand.

Kate took Stuart's hand. The gesture meant a lot to her; it symbolized the beginning of her new role, and maybe a new career as an artist.

- Nice to meet you Stuart, I am Kate.

1.5. Dreams and Reality

Kate was alone again in her book shop trying to digest what had just happened. Where did that idea of coming back to the store appear? Kate could have never met Stuart at all. She wondered who was luckier: Stuart who had found the material for his workshop, or herself as she found an admirer of her art. Or should they just except that as a fact and pursue their common mission?

In any case, Kate had found the new meaning to her hobby today. The opportunity to help other people by drawing provided her with greater satisfaction than the chance of becoming famous. She didn't dream about appearing on covers of magazines or headlines of newspapers any longer. To make the actual difference rather than building up empty popularity was a more rewarding feeling for her. That was the beginning of great journey and she was up to it.

Kate now knew what to read. She looked for a book on art therapy. How did that method work? How could stress be overcome by simply staring at the mixture of colors? Can people control this process? For that, we should probably learn how to measure and direct this type of energy flow.

Kate recalled the drummer she met yesterday. How right he was! She wanted to thank him in some way. But she didn't even know him.

Kate turned on the radio. She imagined that sound waves of a rhythmic tune could help to transport her words of gratitude to the drummer. She could not find any percussion, but she recognized the tune by Rolling Stones. The lyrics were just right for that moment:

“You can't always get what you want
You can't always get what you want
You can't always get what you want
But if you try sometimes you might find
You get what you need.”

2. Vision for Advancing Scientific Research

We often get frustrated when things go out of control or something unexpected happens which prevents us from achieving our goals. We use various technologies to control different processes and assist us in making our decision. The reason we fail sometimes lies in that we look at the processes independently, missing some details which may seem to be irrelevant. In reality, however, many events and processes are interconnected and interdependent. Any technology should be developed in the context of other connected systems. One could have excellent wheels and perfect engine, but the car would never run in case they do not match each other or if oil is missing.

Future scientific inventions should take an interdisciplinary approach. Science, engineering, philosophy, literature, art, politics, history, sociology, psychology, and other subject areas should work together in order to develop complete solutions. We have reached the stage when machines should be put not instead of people, but for people. In other words, technology should assist humans in understanding and being in control of themselves, discovering and realizing their potentials. Technology should be personalized. It should help people to manage processes in real time and facilitate in making instant decisions and adjustments to initial plans as soon as required or a problem is detected. It is not about removing spontaneity and thus excitement of life. It is about becoming more efficient and thus successful. Our resources (including time, money, and natural resources), or in other words energy, are limited and we need to learn to use them efficiently maximizing output we get at the end.

First steps have already been made in this direction. For example, various sensing and recording systems can be used to track events and bodily biological signals in a convenient way and in real time [1], [2], [4]: our clothes can sense our biological signals and brain activity; facial electromyography interfaces can read our emotions; motion capture systems can track our kinematics; our mobile phones can locate us in space etc. Analysis of data collected can reveal (i) how events correlate to each other; (ii) which factors influence one's health, mood, physical and spiritual state and in what way; (iii) how a person responds to different events and stimuli. For example, we could find how a person perceives a certain sound, what emotions does it cause depending on its frequency, loudness, and source. Same with colors, shapes, motion (does emotion influence motion and vice versa?).

Knowing this information, art and performance can be used in a therapeutic manner, to inspire and affect people positively. Dance and music are international languages. The research community has already started to explore the nature and role of kinaesthetic empathy [5], bringing together researchers and practitioners in fields including neuroscience, psychology, computing, dance, film, music, and contemporary embodied practices [6]. One of the questions in this context would be: what is the relationship between different types of tools of expression? Would a piece of music do the same job as a piece of dance or a drawing from the point of view of a neuroscientist

for example? Why do some people prefer musical experiences, while others like to observe or produce motion?

Via group performances we could explore social relationships, i.e. how we do things together, how individuals within a group interact, influence and depend on others' thoughts, habits, attitudes, and intentions. Research shows, for example, that we tend to help each other after doing something together [6]. 'Donors' and 'Vampires' – is there a way to control the amount of energy we give out and take from others?

Future scientific research should be directed to answer the above questions.

References

- [1] A.R. Doherty, C. Gurrin, G.J.F. Jones, and A.F. Smeaton eds. *Proceedings of the ECIR2010 workshop on information access for personal media archives (IAPMA2010)*, Dublin City University, ISBN 1872327869, 2010.
- [2] Y. Kovalchuk, V Callaghan, A Self-Organizing System for Online Maintenance of a Living Organism, *6th International conference on Intelligent Environments (IE'10)*, Kuala Lumpur, Malaysia, 19-21 July 2010.
- [3] S. Martello and T. Paolo, *Knapsack Problems: Algorithms and Computer Implementations*, John Wiley & Sons, 1990.
- [4] D. Pavel, V. Callaghan, A. Dey, Democratization of healthcare through self-monitoring technologies, *Proceedings of the Pervasive Health 2010 conference*, Munich, Germany, March 2010.
- [5] The 'Watching Dance: Kinesthetic Empathy' Project: <http://www.watchingdance.org/>
- [6] International Conference "Kinesthetic Empathy: Concepts and Contexts", 22-23 April 2010, http://www.watchingdance.org/news_events/forthcoming_events/concepts_and_contexts/