

# Nataliya KOSMYNA, Ph.D in Computer Science

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### 1- Personal Statement

I am passionate about an idea of creating a partnership between AI and human intelligence, fusion of a machine and a human brain. I obtained her Ph.D in Computer Science as a part of EHCI team of Université Grenoble-Alpes, France. Most of my projects are focused around Brain-Computer Interfaces in the context of consumer grade applications. I was previously a post-doc at Hybrid team, Inria Rennes, France. I have published and served as a program committee member in conferences and journals such as CHI, Ubicomp, INTERACT, TOCHI, MobileHCI, Frontiers in Human Neuroscience, etc. I gave 2 TEDx talks. I am the author of such projects as piloting a robot using your brain activity, smart home control using EEG. These projects were presented to general public and were tested by more than 3000 people in 2015-2018. I won multiple awards for my work: a prize for best Ph.D dissertation from Université Grenoble Alpes community; a fellowship from L'Oréal-UNESCO for Women and Science in 2016 (30 applications were selected out of 1000+); a fellowship from Dassault Systems US Foundation in 2018. I was also named as Top French Talent 2017 from MIT Innovators Under 35. In 2016 I created my enterprise called Braini, for consulting in the domains of Artificial Intelligence for Cognitive Enhancement as well as Neuroscience.

### 2- Prices and Awards

July 2019	<b>Fellowship</b> MIT Integrated Learning Initiative
June 2018	<b>Fellowship</b> Dassault Systems US Foundation
June 2017	<b><a href="#">MIT Innovator Under 35, French edition</a></b>
October 2016	<b>Scholarship</b> from <b><a href="#">L'Oréal-UNESCO</a></b> for Women and Science (30 laureates/1000+ applications)
September 2016	<b><a href="#">Best PhD thesis 2015</a></b> from Université Grenoble Alpes community

## 3-Education

### a. Studies

I started my education as a Computer Science major and then specialized in Artificial Intelligence (AI) during my research master's degree. Finally my Ph.D thesis was at the crossroads of AI, Human Computer Interaction (HCI) and the Neurosciences.

2012—2015

**PhD in Computer Science** from at Grenoble Informatics Laboratory (LIG), Engineering Human-Computer Interaction research group (EHCI), Grenoble, France. The defense took place in 2015.

- Title : Co-Learning for Brain Computer Interfaces (BCIs).
- Advisor : Franck Tarpin-Bernard, Professor at Joseph Fourier University, the president of the Happy Neuron SBT group, member in the EHCI research group.
- Jury:
  - Dr Robert Jacob, Professor, Tufts University, USA, Rapporteur
  - Dr José Rouillard, Associate professor, Université des Sciences et Technologies de Lille, Rapporteur
  - Dr Bertrand Rivet, Associate professor, Grenoble INP, Examiner
  - Dr Bertrand David, Professor, École Centrale de Lyon, Examiner
  - Dr Jérémie Mattout, Researcher CR1, INSERM Lyon, Examiner

*Description:* Traditionally, BCI research has been focused on signal processing and medical aspects of BCIs, while the aspects pertaining to interaction, usability and convenience, have been studied more scarcely. Commonly, training sessions are slow and tiring. In the context of the *CA-ICO* ("Co-apprentissage pour Interfaces Cerveau-Ordinateur", or in English Co-learning for Brain Computer Interfaces) project of *LIG-EHCI* in collaboration with *GIPSA-lab* and funded by the *Grenoble INP* University and of my thesis research, I am working towards putting co-learning between the system and the user at the center of BCI system design. The aim is to minimize offline training phases and maximize the user experience of BCIs. The ultimate goal is to bring BCI systems outside of the lab with a performance level comparable to more traditional and robust interaction modalities.

2010—2012

**Research Master in Computer Science in Artificial Intelligence and the Semantic Web.** Joseph Fourier University / École Nationale Supérieure d'Informatique et de Mathématiques Appliquées de Grenoble (Ensimag),

Grenoble, France. *With Honors*. Best grade in the promotion for the research project: 16.5/20.

## 4- Positions

- 2017-present      **Post-doctoral Associate**, Fluid Interfaces Group, **MIT Media Lab**, Cambridge, US
- Supervisor: Prof. Pattie Maes; project on cognitive enhancement of humans; novel biofeedback strategies using EEG, EOG and other physiological sensors for attention, engagement and perception; hardware and software contributions;*
- 2015-2017      **Post-doctoral Associate**, Inria Rennes, Hybrid Group (VR, AR and BCIs), France.
- Principal Supervisor: Research Director Anatole Lécuyer; project on perception, attention and mental imagery; project co-supervised with Jérémie Mattout, senior neuroscientist at INSERM, Lyon*
- 2014–2015      **Teaching Assistant** at **Université Pierre Mendès France** (UPMF). Computational Cognitive Psychology Department, Grenoble, France.
- 2013      **Teaching Assistant** at **IUT 1 Grenoble** (translated as *University Institutes of Technology*). Multimedia Internet programming & design Department. Grenoble, France.
- 2012      **Intern**. Master Research Internship; Multimodal Combination of Eye-Tracking and Brain Computer Interfaces for Games. Grenoble, France.
- 2011      **Intern**. Master Project Internship; Development of a 3D application controlled by Brain Computer Interaction. LIG-EHCI. Grenoble, France.

## 5- Research activity and projects

### a. Recapitulation of my Ph.D thesis

**Goal:** Development of Brain-Computer Interfaces as an interaction modality for everyday usage.

**Bottlenecks:** acquisition equipment (price, non-portable), variability of the signals, limited number of applications.

**Contributions** (each one was published at least once in within A/A\* conference or journal):

1. A general architecture based on asynchronous BCI principles and on incremental training combined with an unsupervised blind-source separation filter and a minimum distance classifier.

This architecture allows producing BCIs with minimal training session (within 5 minutes).

2. Intuitive visualization modality for classification outcomes and distance features using Wachspress coordinate projection for an arbitrary number of classes. We combine the visualization with direct feedback mechanism where users can interactively change the classification margin, change the types of features as well as edit the training trials in real-time.
3. Operational Conceptual Imagery BCI based on our architecture, visualization and feedback system that allow for more natural interactions through the imagination of semantic categories and concepts. We show that this type of BCI is more effective at detecting distinct semantic categories rather than close ones.
4. New seamless training protocol for Conceptual Imagery that uses conceptual and semantic priming in order to integrate the training in the narrative and environment of the game without the explicit participation of the user. Our technique leads to better flow and immersion of users in the game.

**Applications and demos/prototypes:** Drone piloting application, [BB8 droid](#) and [Millennium Falcon](#) piloting applications, [DOOM 3 game control paradigm](#), intelligent home control for [healthy people](#) and [people with motor disabilities](#) (platform in Grenoble, France).

## **b. Ongoing post-doc projects (selected)**

### **1. Segregating Observation and Imagination of Auditory, Visual and Tactile modalities for EEG-based Brain-Computer Interfaces (under review).**

One of the most common imagery tasks used today in Brain-Computer Interfaces (BCIs) is motor imagery, asking a user to imagine moving a part of the body. It is used for a number of different tasks, particularly navigation (turning left in the environment). However, motor imagery is considered to be a difficult mental task and it does not work for everybody. This study investigates to what extent can we distinguish alternative mental processes of attention and imagination in auditory, visual and tactile perception to obtain EEG-based BCIs based on the corresponding mental processes. We investigated these three modalities using temporally, spatially and semantically congruent and incongruent audio-visio-tactile stimuli. 27 subjects were instructed to alternatively and selectively mentally imagine a single dimension (modality) of the stimulus following a cue. We investigated the EEG correlates of these mental tasks. The results indicate that it is possible to classify above random accuracy among the three imagination classes, and we can distinguish attention and imagination processes by the alpha band oscillations. We discuss the possible implications of using auditory, visual and motor imagery in EEG-based BCIs, as well as

alpha power to broaden the range of reliable control tasks. **In brief:** it would be possible to use this finding to design the applications, where we are interested to know which modality (audio, visual or haptic) interests the users more. For example, if a user is watching a video lecture, we could possibly detect if he/she is more interested in the audio, visual or haptic parts of it.

## **2. Visual Attention and Visual Imagery: Perspectives for EEG-based Brain-Computer Interface Applications (*Nature Scientific Reports*).**

Currently the most common imagery task used in Brain-Computer Interfaces (BCIs) is motor imagery, asking a user to imagine moving a part of the body. It is used for a number of different tasks, particularly navigation (turning left or right in an environment). However, there are almost no alternatives to motor imagery when imagery tasks are used, though motor imagery is known to be a hard task and not intuitive to people with motor disabilities. This study investigates to what extent can we distinguish alternative mental processes of attention and imagination in visual perception to obtain EEG-based BCIs. 28 subjects were instructed to alternatively and selectively mentally imagine a visual stimulus following a visual cue. We investigated the EEG correlates of these tasks and analyzed the classification accuracies for imagery tasks versus attention tasks but also versus resting (“no-control”) state of the users. The results indicate that it is possible to classify above random accuracy among the two imagination classes, and we can distinguish attention and imagination processes by the alpha band oscillations with an overall accuracy of 77%, imagination processes versus resting state with an accuracy of 81%, one attentional cue versus another attentional cue with an accuracy of 61%. We discuss the possible implications of using visual imagery in EEG-based BCIs, as well as alpha power to broaden the range of reliable control tasks.

## **3. AttentivU: a Biofeedback Device for Monitoring and Improving Attention (*IEEE BSN 2019, IEEE EMBC 2019, AutomotiveUI 2019, ISWC 2018*).**

It is increasingly hard for adults and children alike to be attentive given the overflow of information surrounding us and the constant shifting we all do between increasingly complex tasks. This is an even bigger issue for the 10% of school-aged children and significant number of adults who suffer from ADD/ADHD and are limited in their ability to focus and do well in school or at work. Current solutions - pharmacological and therapy - have modest success rates and many drawbacks. We have developed a wearable solution - AttentivU - a system that uses EEG and EOG electrodes in the form of glasses to measure the attention, engagement and cognitive load of a person in real-time and provides subtle vibro-tactile, auditory or visual feedback when their attention is low. We have tested this device in workplace and classroom settings and have shown that the system makes the user more attentive and results in improved learning and work performance outcomes. We anticipate that our system will be equally relevant and useful for college students, workforce trainees and other work situations where focused attention is critical.

## **Neuroscience and Signal Processing Background**

Scalp EEG recordings (mostly using between 1 and 64 electrodes, experience with 128 electrodes system) on human able-bodied subjects (including subjects with autism, ADD/ADHD) and

subjects with motor disability; EMG recordings; Eye-tracking, including EOG. Other physiological sensing including HR, EDA. Processing using Matlab, Python, C/C++ and Java.

## Methods

1. Controlled experiments: personally conducted 15+XP, 400+participants; during Master, Ph.D and Post-Doc appointments
2. Replication experiments
3. Observational studies
4. Living labs' experiments
5. Studies "in the wild" (3800+ participants)

### c. Dissemination

#### Radio

**Demain\_ai** interviewed me about neurosciences, AI and enterprises. Listen to the podcast from 23/04/2019 [here](#) (in french).

**France Culture**, *Scientific Method* channel featured my work in their [podcast](#) from 24/10/2018.

An interview with me is available at **France Inter** on the 04/07/2016: "Acting on the connected objects with one's mind". Listen to it as a podcast.

The interview with me at **France Inter** on the 19/03/2016: "Taking off the drone with your brain".

The interview with me at **RadioNova** on the 17/03/2016: The magic of the informatics.

An interview with me is available from **France Inter** on the 22/02/2016: "Acting on the connected objects with one's mind". Listen to it as a podcast.

Live radio interview on **France Bleu Isère** on the 3rd of April 2015 about my work on Brain Computer Interfaces.

#### TV

The French TV program **28Minutes @ARTE** interviewed me on 08/08/2019 to talk about my work on brain-computer Interfaces, artificial intelligence, cognitive augmentation as well as our possible future as species (+ a live demo of controlling a small robot using brain signals).

An interview about my work at **France3Bretagne** for their sequence "**9h50 le matin**" is online, July 3, 2017.

"Moving the objects with the force of one's mind" to watch at France 3 Bretagne [here](#), **November 2016**.

"The power of one's thought" to watch at **M6** from 12/10/2016 [here](#).

"How to control an object with one's thought" to watch at **E=M6** [here](#) (in french).

Controlling the robots with one's thought at the **Village of Sciences 2016** to watch [here](#).

Explaining how can we pilot a drone with our brain for 10-15 years old at **LCI TF1** on the 26/03/2016 [here](#) (starting at 4min09).

« Controlling a robot with your brain ». My project is explained at **iTELE** on the 17/03/2016.

«Piloting a drone with your brain is not a science fiction». My project is explained at **France3 Paris IDF** on the 15/03/2016.

"Nataliya Kosmyna pilote des objets par la pensée". Everything about my project is explained [@ARTEfr](#) (in French) or [@ARTEde](#) (in German).

Presenting a brainy drone @TV5MONDE: Controlling the objects with the power of the brain, <http://www.tv5mondeplus.com/video/15-11-2015/le-controle-des-objets-par-la-pensee-956800> (French only).

**Télé Grenoble, 9<sup>th</sup> of April 2015** – Interview and demonstration in the hospital regarding the BCI drone piloting application.

**France 3 Alpes, 18<sup>th</sup> of March 2015** – News segment about neuroscientific research showing the BCI drone piloting application.

**France 3 Rhone-Alpes, 17<sup>th</sup> of March 2015** – Live interview and demonstration about/of the BCI drone piloting application the *Week of the Brain 2015 (La Semaine du Cerveau 2015)*.

**Télé Grenoble, 13<sup>th</sup> of March 2015** – Interview regarding the *Week of the Brain 2015 (La Semaine du Cerveau 2015)*, BCI drone piloting demo.

### **Press (written&online)**

**MIT Integrated Learning Initiative's Q&A** with me where I talk about AI, education and brain-computer tech. "We are limited by the technology of our time" on 06/08/2019.

**Wired** and **CNN** talked to me among other researchers about the recent Neuralink presentation on 22/07/2019.

French journal **Management** has a special issue on neurosciences and emotional intelligence and mentions my start-up, Braini on 16/03/2019.

**Boston Globe** featured one of my new projects: the Thinking Cap. Read about it [here](#) (in English).

French magazine **Le Parisien** featured my work in their [article](#) about brain-computer interfaces, November 2018.

French magazine **Le Point** wrote an [article](#) about me and my work, November 2018.

French magazine **Le Figaro** featured myself and my work in a short [video](#) as well as an [article](#) about **Le Figaro Santé** event, October 2018.

**Article** about my work and myself in "**Paris Match**"; **May 2018**. Check it here (in French).

**Article** about my work, myself as well 9 other extraordinary women in "**Madame Figaro**"; **April 2018**. Check it here (in French).

Several **articles** about my nomination as a **Top French Talent for MIT Innovators Under 35** as well as the extraordinary work of 9 other laureates in **Sciences Et Avenir, Chef d'entreprise, Usine Digitale, Challenges** (in French).

"*She controls her drone with her mind*", an **article** about my work and my nomination as a Top French Talent for MIT Innovators Under 35 in **Nouvel Observateur**. Check it here (in French).

**Article** about me and my work in "**Les Rennais**", a journal of Rennes. Check it here (in French).

**Article** about me in "**Nous Vous Ille**", a local journal of one of Brittany departments. Check the publication here (in French).

**Article** from **blog SIF of Le Monde** journal about my work, 14/02/2017.

**Article** in December 2016 issue of **Quebec Science** featuring my work on Brain-Computer Interfaces.

**Article** from Agence France Presse **about my work on Brain-Computer Interfaces** appeared in **Le Parisien, Le Direct Matin, Sciences et Avenir, TV5Monde, the 2<sup>nd</sup> of december 2016**.

An article about my scholarship from **L'Oréal-UNESCO for Women and Science** appeared at Inria website, October 2016.

**Article** about my work appeared at the website of **Espace des Sciences, october 2016**.

**Video** « Controlling the robots with one's thought » at the **Village of Sciences 2016** to watch here, october 2016.

Read how to control the objects with one's thought in **20 Minutes** here, October 2016.

"Controlling the objects with one's mind" to read at "**The Connexion**" here (in English), October 2016.

"Will we be able to control the objects with the force of our minds" in **Capital** magazine, special issue, July- August 2016, link.

**Article** from July 2016 in **Paris Match** magazine (Hors Série: Revolution of the Brain) we talk about piloting a drone as well as Sphero BB8 droid control with the force of the brain.

**Article** from 01/06/2016-08/06/2016 in **01Net** magazine we talk about piloting a drone as well as Sphero BB-8 droid control with the force of the brain.

**Article** about piloting a drone with your brain appeared on the 03/03/2016 on the cover of MonQuotidien, a magazine for 10-14 years old. You can check some funny drawings from it here.

**Article (Paper, Online)** in "**Dauphiné Libéré**", **Thursday, 14<sup>th</sup> of March 2015** – Coverage of the drone demonstrations for the *Week of the Brain 2015*.

**Article (Online)** on [www.placegrenet.fr](http://www.placegrenet.fr), **Thursday, 14<sup>th</sup> of March 2015**.

**Article (Paper)** in "**Les Affiches**", **13<sup>th</sup> of March 2015** – Coverage of the drone demonstrations for the *Week of the Brain 2015*.

**Article** on the Grenoble Doctoral School College [newsletter and website](#).

**Podcast** of Grenoble University on the Drone Demo for the *Week of the Brain 2015 (La Semaine du Cerveau 2015)*, **30 minute video feature**.

**Article** "[Sciences and Brains in the Lucie Aubrac college](#)" (in french). **18<sup>th</sup> of June 2015**.

**Video Report of AgenceInfoLibre** about Innorobo 2015 with a segment about my demonstration for [smart home control by the brain](#). **July 1 to 3, 2015**.

An article about a brainy drone demo, BB-8 droid controlled by the force of one's mind and a little bit about myself is available in **Ouest France**, L'édition du soir from the 19/01/2016 and in a paper version of Ouest France from the 20/01/2016. Check it here (more photos and a video is available) or here (in French only).

## **Demos and Talks**

I gave a talk and a live [demo](#) at **Kiev Economic Forum**, October 2018.

I gave a talk and a live demo for **Le Figaro Santé event**, Paris, October 2018.

I participated in "**Night of Researchers**" [event](#) to promote French research and French scientists in Riga, for Institut Français de Lettonie, September 2018.

I did a demo for an assistive technology day at **Boston Children's Museum**, September 2018.

I gave a talk at **MIT museum**, "Living in the Future", featuring brain-computer interfaces, September 2018.

I did a demo of the Thinking Cap at **Boston Children's Museum**, August 2018.

I gave a talk during "*Girls in ICT day*" for "**Changing The Face of STEM**" [event](#) for Microsoft Europe Philanthropies in partnership with UNESCO at Brussels, Belgium, April 2018.

I did a demo for **La Poste Innovation** event, March 2018.

I did a demo of piloting a drone with the force of the brain for **Imaginascience**, Annecy, October 2017.

I did a demo of piloting a drone with the force of the brain during **Fete de la Science** in Beauvais, October 2017.

I participated as an **Ambassador of Science** in Salon des Youtubers in Paris. The stand was proposed by *L'Oréal Foundation*, as a part of their program "*For Girls and Sciences*", the aim to *encourage the girls to explore the science and engage in the scientific careers*, 08/04/2017, Paris. I gave a **talk** about Brain-Computer Interfaces but also my work as a scientist for "**Immersion Sciences**" to *schoolchildren* at the island Tudy, France. It is a special week organized for schoolchildren to introduce them to the world of science and *to engage young children and especially girls in the scientific career*. Organized by *l'académie de Rennes, la région Bretagne and le CNRS, Ile Tudy*, 29/03/2017.

I gave a talk about Brain-Computer Interfaces during the **HCI&AI** day in Paris, 17/03/2017.

**Demonstration** of a BB-8 droid controlled by the force of the mind for the **Week of the Brain** in Rennes, 15/03/2017.

**Demonstration** of a drone controlled with the force of the thought for a big European aeronautic company, march 2017.

**Demonstration** of the brainy drone at **Futurapolis 2016** : Piloting a Drone with a Brain Computer Interface using conceptual imagery and EEG headset EMOTIV EPOC. **Toulouse 3-4 November 2016**.

**Talk + Demonstration** of the brainy drone at **Dassault Systèmes** during **Meets Up « New Intelligence »**, **July 2016, Paris**.

**Demonstration** of the brainy drone at **TEDxRennes**, **May 2016**.

**Demonstration** of the brainy drone at **Foire de Paris 2016**, **30 April and 1st May 2016**.

**Demonstration** at **WonderCon 2016** : controlling a BB8 droid with a Brain Computer Interface using conceptual imagery and EEG headset EMOTIV EPOC.. **Los Angeles Convention Centre, 25-27 March 2016**.

**Demonstrations for the Week of the Brain 2016 in Paris**. Piloting a Drone with a Brain Computer Interface using conceptual imagery and EEG headset EMOTIV EPOC. At **Palais de la Découverte**, **14-20 March 2016**. Approximately 1000 bystanders. About 30 people participated.

**Demonstration** of the brainy drone for the European aerospace group, 1 day, 140 international engineers, the 9th of March, Paris, 2016.

**Demonstration** of the brainy drone for 300 managers of the assurance group on the 26/01/2016 in Paris.

**Demonstration** of the brainy drone at TechShop, Paris, France. 31 October 2015.

**Demonstration** of the brainy drone at ImaginaScience, Annecy, France. 14-15 October 2015.

**Demonstration** of the brainy drone at Grenoble Mini Maker Faire. 3-4 October 2015.

**Demonstration at InnoRobo** in Lyon on July 1 to 3, 2015 for *smart home control by the brain*.

**Demonstration** of the brainy drone for the children of VIRA association. June 2015.

**Demonstration** of the brainy drone at the "Informatics Days" in Caen, France. June 2015.

**Demonstration** of the brainy drone at the **Persycup robotics cup 2015**.

**Three demonstrations for the « Remue Méninges 2015 » festival (for the children)** – Piloting a Drone with a Brain Computer Interface using conceptual imagery and EEG headset EMOTIV EPOC.

The purpose of the demo was introducing *children* to research in the neurosciences and in Human Computer Interaction through a practical and recreational application to piloting a drone with one's brain. About 100 bystanders for each of the demonstrations, over 40 children participated in the demonstrations.

**Three demonstrations for the Week of the Brain 2015 (La Semaine du Cerveau 2015)** – Piloting a Drone with a Brain Computer Interface using conceptual imagery and EEG headset EMOTIV EPOC. Grenoble Hospital, Grenoble Children Hospital, Grenoble University. About 200 bystanders for each of the demonstrations, over 40 people participated in the demonstrations.

**Demonstration** of Piloting a Drone with a BCI using conceptual imagery and EEG headset EMOTIV EPOC for 3<sup>rd</sup> year students in signal processing. At Gipsa-lab, March 2015.

**UBICOMP 2014 Demonstration in Seattle.** Piloting a Drone with a Brain Computer Interface using conceptual imagery and EEG headset EMOTIV EPOC. About 30 people participated.

**CHI 2014 Interactivity Demonstration in Toronto.** Piloting a Drone with a Brain Computer Interface using motor imagery and a g.tec USBamp. Photo and social media coverage on my website. About 40 people, including science fiction writer Margaret Atwood participated.

**Presentation of my work during** the Ph.D Students Day, 2014.

**Presentation of my work during** “my Ph.D thesis in 180s”, 2014.

**Presentation of my work during** Grenoble Cognition Day, 2013.

## **TEDx**

**July 2016** talk TEDxVannes.

**June 2016** talk TEDx FHKufstein.

## **d. Publications**

### **Acronymes used for the journals**

**Front.Hum. Neurosci** Frontiers in Human Neuroscience.

**TOCHI** ACM Transactions on Computer-Human Interaction.

**TCIAG** IEEE Transactions on Computational Intelligence and AI in Games.

*ACM Transactions on Computer-Human Interaction (TOCHI* he flagship journal of the Computer-Human Interaction community.

### **Acronymes used for the conferences**

**EUSIPCO** European Signal Processing Conference.

**EMBS** IEEE EMBS Neural Engineering Conference.

**UBICOMP** ACM International Joint Conference on Pervasive and Ubiquitous Computing.

**CHI** CHI SIGCHI Conference on Human Factors in Computing Systems. ACM, New York, NY, USA.

**INTERACT** IFIP TC international conference on Human-computer interaction. Springer-Verlag, Berlin, Heidelberg.

**IHM** International Conference of the Association Francophone d'Interaction Homme-Machine. ACM, New York, NY, USA.

*All the conferences are A or A+ ranking except IHM (no ranking available).*

\* I presented the papers marked with "\*" .

### **Journal articles**

- [PLOS ONE'19] N. Kosmyna, A. Lécuyer (2019). **A conceptual space for EEG-based brain-computer interfaces.** PLOS ONE 14(1): e0210145. <https://doi.org/10.1371/journal.pone.0210145>
- [Nature Scientific Reports'18] N. Kosmyna, J. Lindgren, A. Lécuyer (2018). **Attending to Visual Stimuli versus Performing Visual Imagery as a Control Strategy for EEG-based Brain-Computer Interfaces.** *Scientific Reports, Nature*, volume 8, Article number: 13222.
- [Front.Hum. Neurosci'17] N. Kosmyna, A. Lécuyer (2017). **Designing Guiding Systems for Brain-Computer Interfaces.** *Front.Hum.Neurosci.* <https://doi.org/10.3389/fnhum.2017.00396>
- [Front.Hum. Neurosci'16] N. Kosmyna, F. Tarpin-Bernard, N. Bonnefond and B. Rivet (2016) **Feasibility of BCI Control in a Realistic Smart Home Environment.** *Front.Hum.Neurosci.*10:416. doi:10.3389/fnhum.2016.00416
- [TOCHI'15] \* N. Kosmyna, F. Tarpin-Bernard and B. Rivet. **Conceptual Priming for In-game BCI Training.** *ACM Trans. Comput.-Hum. Interact.* 2015.
- [TOCHI'15] \* N. Kosmyna, F. Tarpin-Bernard and B. Rivet. **Adding Human Learning in Brain Computer Interfaces (BCIs): Towards a Practical Control Modality.** *ACM Trans. Comput.-Hum. Interact.* 22, 3, Article 12 (May2015),37pages.DOI=10.1145/2723162 <http://doi.acm.org/10.1145/2723162>.
- [TCIAG'13] N. Kos'myna and F. Tarpin-Bernard. **Evaluation and comparison of a multimodal combination of BCI paradigms and Eye tracking with affordable consumer-grade hardware in a gaming context.** 2013. In *IEEE Transactions on Computational Intelligence and AI in Games*. Volume 5. Issue 2. DOI <http://dx.doi.org/10.1109/TCIAIG.2012.2230003>.

### **Peer-reviewed full papers at international conferences**

- [IEEE EMBC'19] \* Nataliya Kosmyna and Pattie Maes. **AttentivU: A Biofeedback Device to Monitor and Improve Engagement in the Workplace.** In *41st Annual International Conference of the IEEE Engineering in Medicine and Biology Society*, Berlin, Germany. July 23-27, 2019. *To appear.*

- [IEEE BSN'19] \* Nataliya Kosmyrna, Caitlin Morris, Utkarsh Sarawgi, Pattie Maes. 2019. **AttentivU: a Wearable Pair of EEG and EOG Glasses for Real-Time Physiological Processing**. In the *16th IEEE-EMBS International Conference on Wearable and Implantable Body Sensor networks*.
- [IEEE EMBC'18] Xinlei Zhang, Nataliya Kosmyrna, Pattie Maes, Jun Rekimoto. **Investigating Bodily Responses to Unknown Words: A Focus on Facial Expressions and EEG**. In *40th Annual International Conference of the IEEE Engineering in Medicine and Biology Society*, Honolulu, HI, USA, July 17-21, 2018.
- [EUSIPCO '15] \* N. Kosmyrna, F. Tarpin-Bernard and B. Rivet. **Operationalization of Conceptual Imagery for BCIs**. *EUSIPCO'2015*. In *Proceedings of the 23d European Signal Processing Conference*, Aug. 2015.
- [INTERACT'15] \* N. Kosmyrna, F. Tarpin-Bernard and B. Rivet. **Towards Brain Computer Interfaces for Recreational Activities: Piloting a Drone**. *15th IFIP TC.13 International Conference on Human-Computer Interaction – INTERACT 2015*. Springer Berlin Heidelberg (2015).
- [IEEE EMBS'13] \* N. Kos'myna, F. Tarpin-Bernard and B. Rivet. **Towards a General Architecture for a Co-Learning of Brain Computer Interfaces in** *Proceeding of the 6th International IEEE EMBS Conference on Neural Engineering*, San Diego, USA, November 2013.

#### ***Peer-reviewed papers at national conferences***

- [IHM'12] \* N. Kos'myna and F. Tarpin-Bernard. **Une combinaison de paradigmes d'interaction cerveau-ordinateur et suivi du regard pour des interactions multimodales**. in *Ergonomie et Interaction Homme-Machine ErgoIHM'2012*.

#### ***Extended abstracts***

- [CHI'19] Nataliya Kosmyrna, Caitlin Morris, Utkarsh Sarawgi, Pattie Maes. 2019. **AttentivU: a Biofeedback System for Real-time Monitoring and Improvement of Engagement**. CHI'19 Extended Abstracts on Human Factors in Computing Systems.
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