## EVENT 1: A Gruelling 24-Hour Capture the Flag Event

Reply Challenges, a renowned online Capture the Flag (CTF) event, recently brought together thousands of teams from around the world for an intense 24-hour cybersecurity competition. With over 4000 teams participating, the event proved to be a thrilling test of skills, problem-solving abilities, and teamwork. In this blog post, we will dive into the first-hand experience of one team, their challenges, triumphs, and valuable lessons learned along the way.

As the Reply Challenges event approached, our team, SaltyBois, understood the importance of being well-prepared and mentally focused. With this in mind, we decided to utilize the night before the official start time to our advantage. While the clock ticked away, we engaged in a series of warm-up exercises, which sharpened our skills since we were all quite rusty.

As the clock struck 7:30 AM on Friday, our team eagerly embarked on this exhilarating journey. Armed with determination and a strong desire to compete, we faced our first hurdle—finding a program to solve the initial word puzzle. Despite initial struggles, we managed to make progress with the help of a partially completed website.

Throughout the event, we encountered a diverse range of challenges that tested our coding, cyber security and problem-solving skills. The team's efforts were focused on two specific exercises, and though progress was slow, we persevered. Hours of hard work and collaboration finally paid off when we successfully cracked one of the challenges, uncovering a much-deserved flag.

Despite solving only one exercise, our team discovered that success wasn't solely determined by the number of tasks completed. Remarkably, we found ourselves among the top 10% of participants, ranking 286th out of 4000+ teams.

As the event unfolded, new exercises were introduced, presenting fresh opportunities and complexities. One particular coding exercise stood out, offering a chance to earn a substantial 400 points. However, grasping the task's nuances proved challenging, leaving us with more questions than answers. Uncertainty loomed as we grappled with understanding the sequence of numbers, struggling to decipher the instructions.

The Reply Challenges event provided an eye-opening experience for our team, reinforcing the importance of perseverance, collaboration, and adaptability. It became evident that success wasn't solely dependent on solving every task but rather on the learning and growth that took place during the competition. The event served as a powerful reminder of the immense knowledge and experience within the cybersecurity community, further motivating us to expand our skill set and remain vigilant in the ever-evolving field of cybersecurity.

Reply Challenges offered an exhilarating 24-hour journey filled with intense competition and the opportunity for personal and professional growth. While we may have solved only one exercise, we emerged with valuable lessons, a renewed determination. We eagerly anticipate future challenges and opportunities to further refine our skills and make our mark in the captivating world of cybersecurity.

## EVENT 2: Unveiling the Transformative Power of AI in Biological Science, Drug Discovery, and Medicine

In the ever-evolving landscape of scientific advancements, the intersection of machine learning and artificial intelligence (AI) with biological science, drug discovery, and medicine has emerged as a catalyst for ground breaking breakthroughs. Recently, an esteemed online event organized by The Royal Society brought together influential minds, experts, and researchers from various disciplines to explore the potential and implications of AI in these fields. This article delves into the key insights and highlights from the event, shedding light on the remarkable progress being made and the challenges that lie ahead.

#### Biology

The event kicked off with Dr. Anne Phelan discussing the fundamental role of AI in disease research. By leveraging AI, researchers can effectively organize and analyse vast amounts of complex and often incomplete data, unveiling patterns that were previously elusive. As Dr. Phelan aptly stated, "We are drowning in a sea of data, but starving for knowledge." The continuous progress in AI presents an unprecedented opportunity to revolutionize how we harness data for scientific advancements.

Dr. Imran Haque, a data scientist, emphasized the significance of mapping in biology. By restructuring decades' worth of research on breast cancer, AI enables researchers to gain a clearer understanding of the biological landscape. Crucially, AI helps identify relationships between genes, highlighting potential solutions as well as potential risks when certain genes interact. The challenge now lies in standardizing data, but promising progress is being made towards achieving this goal.

Addressing the critical issue of applying the right drugs to the right patients, Professor Walter Kolch showcased how AI can revolutionize cancer treatment. By individualizing treatment plans using AI, researchers can identify patients susceptible to specific types of cancer and administer personalized drug combinations. This remarkable advancement holds the potential to enhance patient outcomes and reshape the future of medicine.

#### Chemistry

Professor Andreas Bender highlighted the importance of critical data in chemistry rather than the sheer quantity of data. Contextual understanding and avoiding a binary model are key challenges in leveraging AI effectively. Professor Bender emphasized the need to focus on improving the questions we ask, as they form the basis for generating research and fuel AI advancements.

Dr. Lucy Colwell presented an intriguing application of AI in protein sequence analysis, specifically in the context of COVID research. AI aids in identifying protein interactions and potential therapeutic targets, revolutionizing the field of drug discovery. The power of AI in analysing complex patterns within sequences became evident, leading to the discovery of unintuitive yet highly effective sequences against omicron and other variants.

Professor Charlotte Deane shed light on the intricacies of using machine learning in the context of biological data. The need for similarity between data sets and the challenge of validating models highlighted the importance of community collaboration and the sharing of best practices. By leveraging synthetic data and focusing on general models, researchers can optimize the performance and reliability of AI in biological applications.

#### Medicine

The application of AI in medicine was showcased by Aditya Nori, who emphasized the significant impact AI has already had in cancer treatment. From faster tumour detection to ensuring accurate treatment and drug administration, AI has the potential to save time, reduce errors, and improve patient outcomes. Open-source technologies further enhance accessibility and facilitate widespread adoption.

Dr. Kim Branson explored the complexity of diseases as system-level properties. AI enables researchers to simulate and explore the behaviour of diseases in unprecedented ways, bridging the gap between theoretical models and real-world applications. By asking simple yet essential questions, researchers can utilize AI to determine optimal intervention strategies, leading to more effective treatments.

Professor Daphne Koller demonstrated how high-level data produced through AI can enhance our understanding of complex diseases. By combining cellular and clinical data researchers can define diseases more accurately, paving the way for novel insights and potential treatment options. Deep faking scenarios based on sufficient data enables researchers to explore different outcomes and identify potential solutions.

The online event organized by The Royal Society provided a captivating glimpse into the ground breaking potential of AI in biological science, drug discovery, and medicine. From unravelling complex relationships in biology to enhancing drug discovery through protein sequence analysis, and revolutionizing healthcare through personalized treatments, AI is reshaping the future of these fields. However, challenges remain, such as data standardization, model validation, and ensuring responsible use of AI. Collaborative efforts, community engagement, and the pursuit of best practices will be crucial in harnessing the full potential of AI to benefit humanity and advance scientific progress.

## EVENT 3: Exploring the Future of Technology, insights from an NVIDIA Event

Recently, I had the opportunity to attend an NVIDIA event focused on cutting-edge technologies, from building digital twins to accelerating automated driving and exploring the potential of augmented and virtual reality (AR/VR) in Omniverse. In this blog post, I'll provide you with a glimpse into the exciting sessions and share key takeaways from industry experts. While some sessions were more engaging than others, the event shed light on the transformative potential of these technologies in various fields.

In this session, Jose Minguez, a Senior Software Developer at DB Systel GmbH, discussed the development of a digital twin of the German rail network. By utilizing sensors and data collection tools provided by the Sensors4Rails project, valuable information could be obtained for environmental modelling, agent modelling, train physics, and data for AI. The digital twin allowed for the simulation of various scenarios, such as accidents or objects falling on the tracks, enabling the enhancement of AI models and the improvement of safety measures.

A panel discussion featuring industry leaders focused on the challenges and advancements in automated driving. The panellists, including Norm Marks from NVIDIA, Ödgärd Andersson from Zenseact, Albert Meixner from Nuro, and Annie Lien from VinAi, highlighted the importance of robust systems and the potential to significantly reduce severe accidents through the use of technology. Overreliance on AI systems and human behaviour were also discussed, emphasizing the need for improved usage practices and system redundancy. The panellists emphasized the potential of a subscription-based business model for software updates and the eventual cost reduction of new technologies.

During the next session, NVIDIA staff members delved into the significance of raytracing in XR and the advantages of Omniverse over traditional game engines in the context of augmented and virtual reality. The experts highlighted the superior structure of Omniverse for XR and VR applications and their ongoing development of a streaming client for Oculus. The discussion emphasized the importance of raytracing in creating immersive experiences that align with our brain's visual perception, underscoring the potential of Omniverse in driving the future of AR and VR technologies.

Attending the NVIDIA event provided me with valuable insights into the future of technology across different industries. From the development of digital twins to enhance safety measures in transportation to the acceleration of automated driving and the immersive potential of AR and VR in Omniverse, the event showcased the ground breaking advancements taking place.

While some sessions may have leaned towards promotion, the collective knowledge shared by industry experts shed light on the transformative power of these technologies. We can anticipate a future where digital twins, AI-driven systems and immersive experiences become increasingly integrated into our daily lives, improving safety, efficiency, and overall user experiences.

As technology continues to evolve, it's crucial to stay informed and explore the potential applications and implications in various fields. By embracing these advancements, we can drive innovation, create inclusive environments, and shape a future where technology enhances our lives in meaningful and transformative ways.

## EVENT 4: A Thrilling Journey at the Interuniversity Job Market for Young Researchers

On the 23rd of March 2023, an Interuniversity Job Market for Young Researchers took place at the vibrant Flanders Expo Gent. It was a remarkable event that provided an avenue for young researchers to explore exciting career opportunities. Accompanied by a group of three, our experience at the job market was nothing short of exhilarating.

As we embarked on our journey, we encountered a minor hiccup in finding the entrance. However, our determination led us to the doors of the Flanders Expo Gent, where we were welcomed by an array of vibrant badges. Our badges, adorned with the colours representing the IT and Engineering sectors, instantly signified our areas of specialization.

To our surprise, we soon realized that the demand for IT professionals was high among the participating companies. Walking through the bustling venue, we were approached by numerous stand owners seeking to engage with us. This experience provided us with a newfound sense of appreciation for our field of expertise. It was gratifying to be recognized and valued for our skills, reinforcing the importance of our work in the industry.

As we ventured further into the event, we discovered an abundance of stands representing a wide range of companies. Our exploration was accompanied by a generous distribution of freebies, turning the event into a treasure trove of goodies. Candy, flyers, games, pens, and bags became our cherished souvenirs of the day.

Beyond the freebies, stands offered more than mere promotional materials. Some companies hosted competitions, adding an element of excitement to our experience. The presence of arcade games, including classics like Street Fighter and Pac-Man, heightened the competitive spirit. One of our group members emerged victorious in the Pac-Man challenge, securing 200 euros worth of Coolblue gift vouchers. Another stroke of luck gifted us four tickets to any amusement park in Flanders. These unexpected wins added an extra layer of delight to our already fulfilling day.

Amidst the bustling atmosphere, we also had the pleasure of encountering fellow students from Howest, our alma mater. These chance meetings allowed us to share our experiences and bond over the excitement of the event. It was a testament to the close-knit community and strong network fostered by our university.

As the day drew to a close, we reflected on the incredible journey we had undertaken at the Interuniversity Job Market for Young Researchers. From the initial struggle to find the entrance to the overwhelming appreciation we received, it was a day filled with unforgettable moments. The event not only showcased the demand for IT professionals but also provided us with the opportunity to engage with industry leaders and discover potential career paths. With our goody bags filled and hearts brimming with satisfaction, we bid farewell to the event, carrying cherished memories and exciting prospects for the future.

## EVENT 5: Using LEGO to Support Children with Anxiety, a Path to Building Confidence and Well-being

As a break from all the IT stuff I decided to follow another online event unrelated to IT as a change of pace. Since working in IT can result in a lot of stress and anxiety I decided to follow a 1 hour session about anxiety and how LEGO can help with it. Sadly enough when the session started I immediately noticed that it was not what I had in mind. It was someone speaking about how to help autistic children with LEGO and not anxiety in general. Despite that, I still followed along since I found it interesting.

Anxiety is a common experience that affects people of all ages, but for children, it can be particularly challenging to navigate. As we strive to create inclusive and supportive environments, it's essential to explore alternative approaches that foster well-being. In this blog post, we'll discuss the connection between LEGO play and anxiety, highlighting the potential benefits and strategies to alleviate anxiety symptoms in children.

Before delving into LEGO's role, it's crucial to understand anxiety itself. Anxiety is a natural response to perceived threats or stressful situations. However, when anxiety becomes excessive, it can hinder a child's daily life and lead to a range of difficulties, including social interactions and academic performance.

Children with anxiety often struggle to fit in, experiencing a sense of isolation and self-doubt. Additionally, they may worry about matters beyond their control, leading to increased anxiety levels. It's important to recognize that anxiety affects a significant number of children, closely tied to the prevalence of depression.

Traditional methods of addressing anxiety in children often fall short, leaving room for more gentle and inclusive strategies. Outdated information found online can perpetuate ineffective techniques, hindering progress. Instead, we should focus on creating accepting environments that promote individuality and self-expression.

Enter LEGO, a versatile and beloved toy that holds tremendous potential for supporting children with anxiety. The benefits of LEGO play extend beyond mere entertainment, as it promotes cognitive, physical, and social development. By incorporating LEGO into therapeutic approaches, we can harness its power to reduce anxiety and enhance overall well-being.

When children engage with LEGO bricks, they enter a realm of limitless creativity. The act of building with LEGO can reflect their inner thoughts and provide an outlet for self-expression. Moreover, successfully constructing something with LEGO brings a sense of relief and accomplishment, fostering confidence and self-esteem.

LEGO play not only offers a platform for creative expression but also serves as a catalyst for play-based learning and the development of crucial social skills. By incorporating LEGO into therapeutic practices, we can make activities such as gross motor skills exercises, breathing exercises, group work, and emotional exploration more enjoyable and engaging.

LEGO play also offers opportunities for collaborative group work. Children can come together and work on building projects, fostering communication, cooperation, and teamwork. By engaging in joint LEGO creations, children learn to share ideas, compromise, and listen to others' perspectives. These social skills are invaluable in navigating various social settings and can help children with anxiety feel more comfortable and accepted among their peers.

By embracing the power of play-based learning and the inherent benefits of LEGO, we can empower children with anxiety to navigate their world with increased resilience, self-assurance, and joy. Let us continue to explore innovative approaches that celebrate individuality and foster inclusivity, ensuring that every child has the opportunity to thrive and overcome the challenges that anxiety may present.