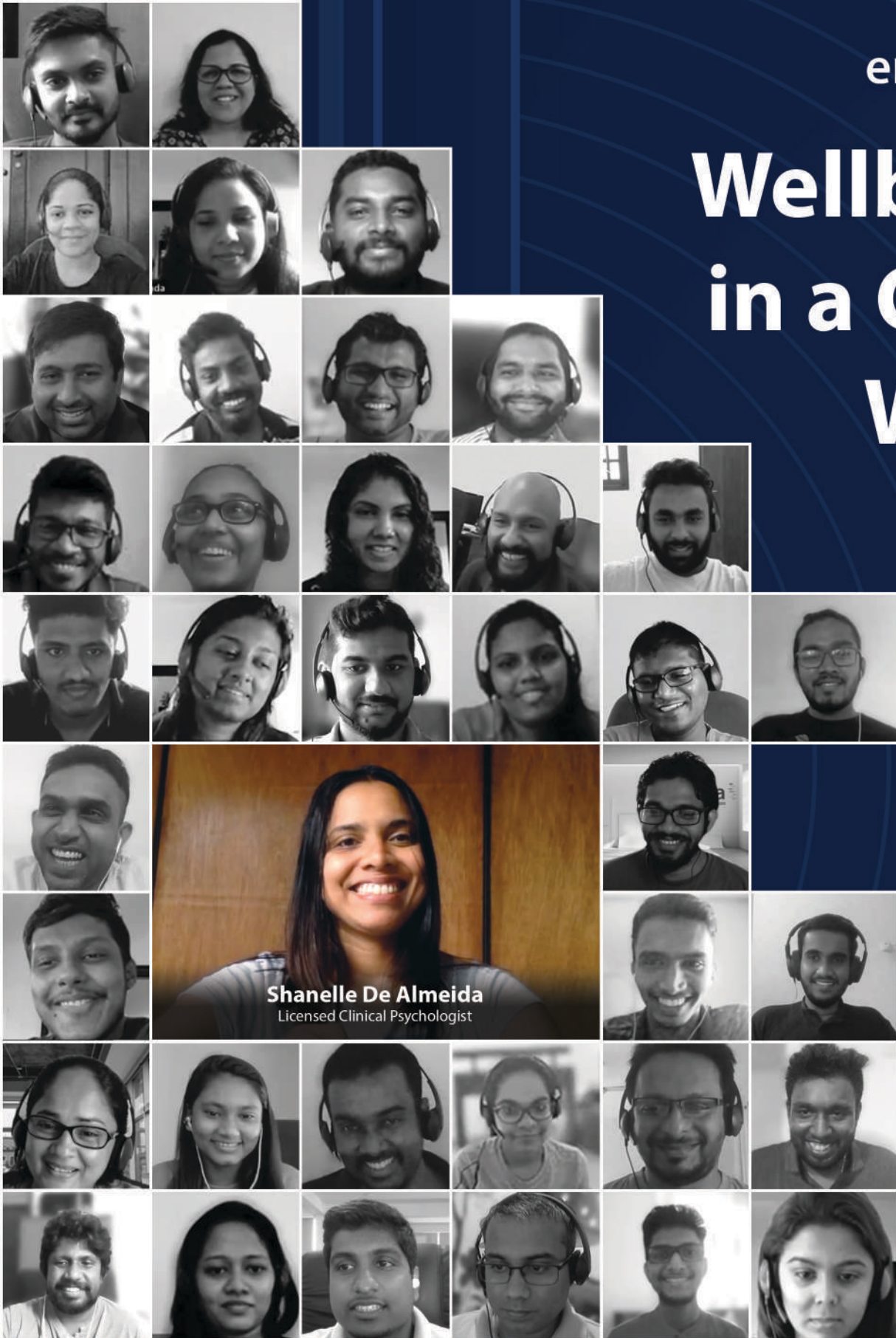embla | Software Innovation

Wellbeing in a Covid World

2021

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EDITORIAL
Chamil Kandamby

At the start of 2020, we got hit by "covid-19". Just after that, government declared lockdown throughout the country. That is the time when the concept of "work from home" became practical. Even thought many businesses took a hit and closed due to lockdown and the pandemic, IT and medicine became the bestselling industries. The key to survive is to be able to work online in the IT industry, all the other industries also thought of going to "online" due to this. Apart from being able to work from home, this may be one of the reasons which led the IT industry to grow. However, unfortunately, some IT companies failed without knowing how process through the lockdown.

Embla, as a great innovation center who identified this situation before the pandemic, took measures to make sure the "work from home" would work without any obstructions. As the staff was not aware before of how to process the "work from home" concept, they had to make process concepts and policies that would make working from home the same as working in the office. For a staff who needs an isolated environment for logical thinking, working from home

would not be recommended as a good environment. As mentioned, an isolated environment does not always mean a quiet environment as some may also prefer an environment with music or loud sounds; whichever environment they need to concentrate for work. On the other hand, SriLankans - who mostly live with large families – sometimes are asked to help with daily household chores, which can lead to the disturbance of the isolated environment I mentioned before. In addition to that, the fear of facing the pandemic and being isolated in one place also made their mind unstable.

Everything cannot be succeeded at the first attempt. When you need to adapt to something new, you need to try it first, then take a break,

review what you have done ("Retrospective"), then learn from the errors that you faced. As staff who is familiar with these concepts, it is not a hard task to learn and adapt to the new "work from home" concept.

We greatly appreciate the support we had from all our colleagues at Embla in order to make this magazine a success despite their busy schedules. All articles in TechDeep are written by our staff. The magazine will be hosted on our website and can be collected at our office as a printable version. If you wish to share your feedback, we welcome your thoughts for upcoming editions of TechDeep magazine.

Sasini De Silva   Hiran Hasanka

CEO'S NOTE
Chandimal Wickramaratne

Maturity of mind is the capacity to endure uncertainty" - John Finley, English historian and mathematician.

The year 2020 has become a turning point in human history. As the COVID-19 pandemic continues to impact all aspects of our lives, the uncertainty and the epidemic growth of the virus have resulted in everyone living in a chronic state of fear and distress. When the country went into lockdown during April 2020, we were unclear as to how we can face this situation; Do we have the right tools and resources to navigate this situation? Do we know how we can move forward and handle all the challenges that come with it? How are we going to retain our customers? How will they be affected? How will our families be affected? A lot of questions popped up in our minds during that time.

All businesses face turbulent waters every now and then, and Embla is no exception. Thought out Embla history, so many challenging situations we faced as a team, and we overcame it. Even-though the scope is much larger during the pandemic, the turbulence is the same. When in trouble, we highly depended on our past experiences, proven processes and maturity of how we worked to get us through these difficult times.

Hence, we relied on "Process Agility"; the same process we use to deliver quality software services to our customers, to overcome these challenges. The Agile Scrum process contains the "Plan-Do-Check-Act" cycle, which helps teams improve their maturity to produce quality software. During the pandemic, we used the same principles to reduce the risk thereby making our clients and employees face these challenges with maturity and grace.

Concepts such as "lockdowns," "social distancing," "mask mandates," and "work from home" were unknown to most of us and today, they have become a part of our everyday language. Therefore, our first step was the implementation of a Work From Home (WFH) policy for our employees to follow. We had the policy reviewed at the end of each week through the experiences we collected; the mistakes we made, and the good actions that we can continue to do. It eventually became an agile scrum process where we had daily meetings with our admin and team leads and revised the policy at the end of the week for the next cycle.

Not only on the working process, but also, we followed the same protocol for the tools that we needed in order for us to complete this process. For example, in parallel we upgraded our HR system to support the WFH model. Of course, it was impossible to complete all required changes within a day. We had to prioritize our requirements based on the value it provided and we felt it provided a good benchmark for supporting and safeguarding our employees.

At Embla, the health and safety of our colleagues, clients, partners and the communities in which we operate has always been our number one priority. The value we create has to be in-line with our clients and our partners. To ensure this, we had short client meetings to measure our progress each week to keep ourselves aligned to give the best outcome to our clients.
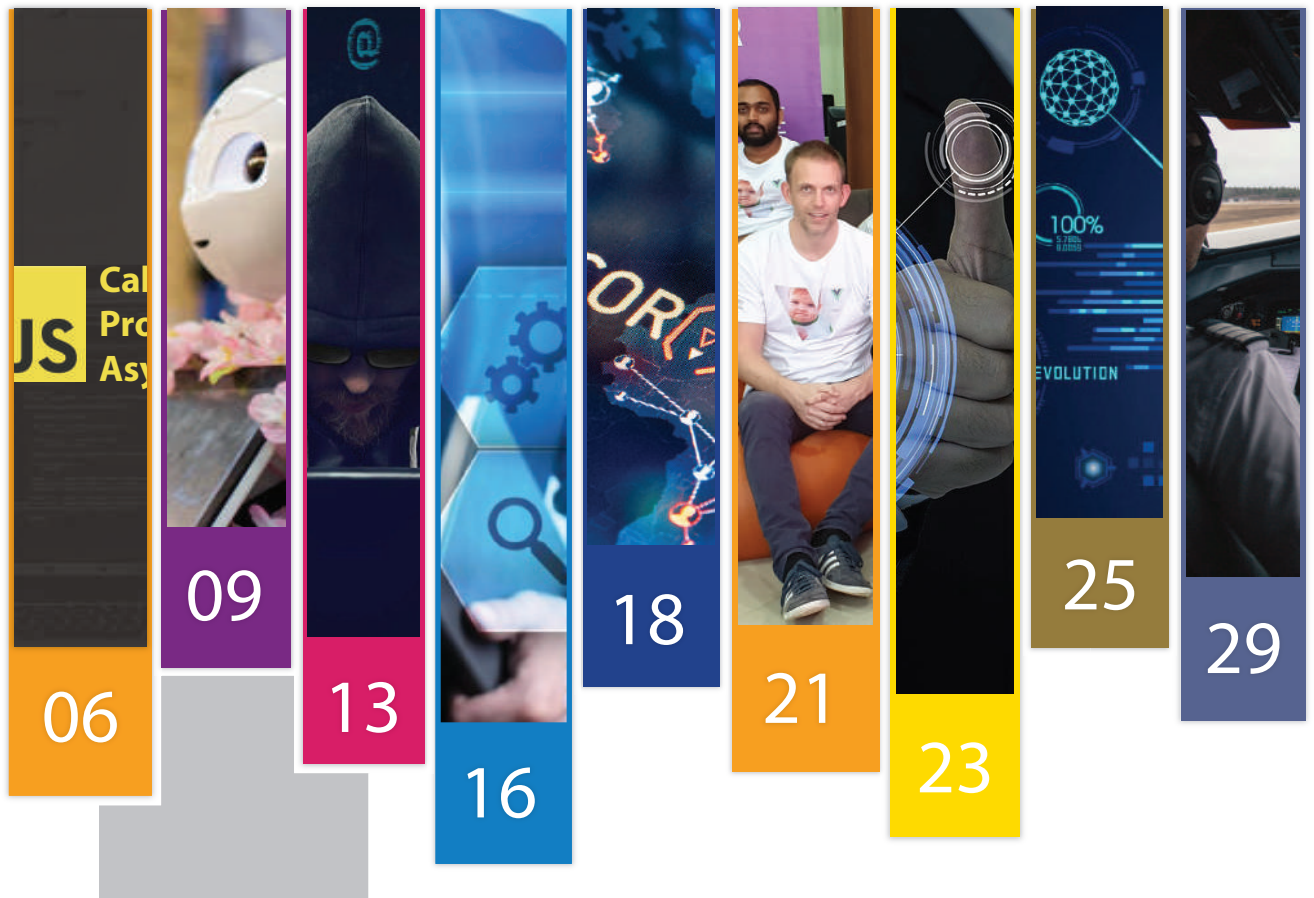
The upcoming year will be no different, and we understand that there will be more challenges in the future. We are extremely proud of and grateful to our teams who put in a lot of effort every day to ensure business continuity and we will continue to take significant steps to safeguard and support them. Thanks to our team as well as our partners, we will face them head on to overcome these adversaries.

CONTENT

Callback
Promises
Async / Await

JAVASCRIPT: ASYNC, PROMISES & CALLBACKS

Amitha Perera

JavaScript is single threaded. It can only execute one task at a time. Suppose we have few line of code to execute for various of actions, JavaScript is not going to execute all the line simultaneously. It will run all the steps in sequence, after each other. But this has a downside. What if we have certain operations that take bit longer time to execute. Think about the below line of code.

```
console.log('01');setTimeout(()=>{con-
sole.log('02')}), 1000);
//this task is taking more time(doesn't matter
whether it is ms or seconds) could be HTTP request
console.log('03');
```

So the second line is blocking the execution of other code lines until set timer is done. So this is what happened if JavaScript treat setTimeout as it would treat all other code blocks. But in most cases we don't need to wait till this longer taking one is done.
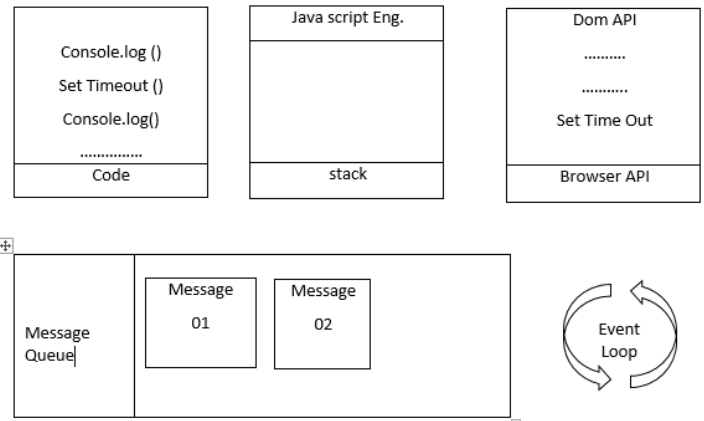
JavaScript and the browse have a solution for this. If it is a longer taking task, can hand it off to the browser by calling the setTimeout function. Since browser is able to use multiple threads it can allocates one for JavaScript and one for other task. Therefore the JavaScript code is not block any more.

Firefox allocate separate thread for each tab and Chrome uses multiprocessing(single process for each tab). Firefox is faster than the Chrome but there is a high possibility to crash firefox than the chrome

But the browser needs a way to communicate back to our JavaScript code. Typical way is callbacks functions. First argument of setTimeout function is a callback functions so once the browser is done with it task this callback functions is the one browser needs to callback with it's result.

Message Queue, Event Loop and Async code

When JavaScript code started to execute **"Stack"** which is part of the JavaScript engine is responsible for take care of certain tasks. When stack filled with tasks like setTimeout(Browser APIs) it directly hand those tasks off to the browser. Then stack become empty and can execute next line of JavaScript code. Now the browser is responsible for take care of the uploaded task, in this case it is setTimeout which has callback function as a first argument. When the browser task is done callback functions should be invoke, for this **Message Queue** is used.

Code	stack	Browser API
Console.log ()	Java script Eng.	Dom API
Set Timeout ()		....
Console.log()		....
....		Set Time Out

Message Queue	Message 01	Message 02	Event Loop

Message queue is provided by the browser and also linked to the JavaScript. Browser register a **to do task** inside the queue. When the stack is empty, to do task which is in the queue should be executed for that we need to take queue message in to the call stack, for this we use the **Event Loop**. Event loop also build into the browser or we can say to the host environment. Event loop is always running and check whether the call stack is empty or not and also check whether there are any pending messages in the message queue. If true then it pushes any waiting messages into the call stack. This is what happened behind the seen and pattern of the asynchronous code execution.

Callback hell and Promises

```
callbackhell.js                    x
 1
 2          var floppy = require('floppy');
 3
 4          floppy.load('disk1', function (data1) {
 5              floppy.prompt('Please insert disk 2', function() {
 6                  floppy.load('disk2', function (data2) {
 7                      floppy.prompt('Please insert disk 3', function() {
 8                          floppy.load('disk3', function (data3) {
 9                              floppy.prompt('Please insert disk 4', function() {
10                                  floppy.load('disk4', function (data4) {
11                                      floppy.prompt('Please insert disk 5', function() {
12                                          floppy.load('disk5', function (data5) {
13                                              floppy.prompt('Please insert disk 6', function() {
14                                                  floppy.load('disk6', function (data6) {
15                                                      //if node.js would have existed in 1995
16                                                  });
17                                              });
18                                          });
19                                      });
20                                  });
21                              });
22                          });
23                      });
24                  });
25              });
26          });
27
```

In most cases we have more than one callback nested into each other, then we enter something call Callback hell. These codes can be cumbersome to read and maintain. So this is where JavaScript concept call promises comes to play.

How we can create a promise and user it in our code?

```
// create Timer function which
return a promise
const timer = (timeDuration) =>
{
   const promise = new Prom-
ise((resolve, reject) => {
    if(timeDuration > 5000){
         reject('Error:  Time
Expired!');
    } else {
      setTimeout(() => {
        resolve('Done!');
      },timeDuration);
    }
  });
  return promise;
};// call the Timer function
timer(2000).then(data => {
  console.log(data);
}, error => {
  console.log(error);
});
```

Promise is a class which is built into the JavaScript and take a function as a constructor argument and that function takes two arguments and each argument itself is a function(resolve and reject). When we create a promise, it's execute it constructor function right away. Inside this function can define anything you want. Must keep remember that you need to execute resolve func

tion and return the promise object, then only can access the "then" when we call the promise. Like above can warp any code block inside a new promise and then resolve and return that promise object. Also can have multiple "then" block if it has multiple promises (promise chaining). What about the catch block?

```
.then(data => {
  console.log('1');
})
.then(postData => {
  console.log('2');
})
.catch(err => {
  console.log('error');
})
.then(postDataLast => {
  console.log('3');
})
.catch(err2 => {
  console.log('error 2');
})// result
1
2
error
3
error 2
```

The 'catch' block does not avoid/skip execution of rest of 'then' blocks.

scenario 1: if first promise reject

```
// result
error
3
error 2
```
scenario 2: if third promise reject

```
// result
1
2
error
```

Async await

Modern JavaScript also has an alternative solution to ignore catch and then blocks which we have in promises. What just need to do is add async in front of the function name then the function become a promise (return a promise object). Behind the seen it wrap the whole function inside a new promise like we discuss in above. Because of async now we can use **await** inside the function

```
async function sample(){
  const getTimer = await tim-
er(2000);
  console.log(getTimer);
}
```

Here we missed the error handling, catch block which we had with promises. With async await we use **try catch** to handle errors.
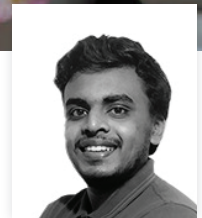
```
async function sample(){
  try{
    const getTimer = await
timer(2000);
    console.log(getTimer);
  } catch(error){
    console.log(error);
  }
}
```

Keep remember: Async await increase the readability of JavaScript code and it **does not changed the way of JavaScript works.**

BIAS IN MACHINE LEARNING: SHOULD WE BE WORRIED?

Hiran
Hasanka

Machine learning, being one of the most revolutionary ideas in the modern world, can be described as a set of computer algorithms that are able to identify patterns from given data (or simply "learn" from data) and make decisions by its own or with minimal human intervention. Machine Learning algorithms are widely used almost everywhere in the modern lifestyle; from suggesting Youtube videos to facilitating self-driving cars. Applications of ML has certainly made life easier at some point. Machine Learning has come a long way increasing credibility, so that in the modern world, it is replacing human operators/experts in complex tasks like loan approval, shortlisting applications for university admissions and even assisting law enforcement by predicting potential criminal activity. Needless to say, some of these tasks can be considered as sensitive subjects in a way.Humans handling such tasks can be problematic sometimes because it would cause results that would be unfair to individuals or groups of people as they can be biased and thus can be unfair in taking decisions.

Since Machine Learning algorithms are computer programs, many people believe that they cannot be biased. Hence, they can be trusted with handling sensitive tasks. Let's take a deeper look at the matter at hand and see if there is any evidence that would suggest otherwise.

Bias

Bias is the prejudice for or against one person or a certain group, often in ways that would be considered unfair. According to Psychology Today, some biases can be positive and helpful, like choosing to stay away from toxic people. In most cases, bias is identified as stereotypes about people categorized into groups based on their characteristics like ethnicity, religious background and sexual orientation.By design, humans are wired to have biases and most of us are taught to have biases in certain aspects of our lives.

Best examples for biases and stereotypes would be people believing that "black people are athletic" and "Asian people are smart". Misunderstandings that are followed by bias can escalate many destructive levels like history's worst examples of stereotyping; slavery and Holocaust. Bias can affect decisions made by humans in situations like filtering out resumes of applicants for a job opening, approving a loan or some more serious tasks like a judge sentencing a man to death. In every situation like this, there is a chance for people to be affected negatively because of the natural bias that is rooted into decision makers. Since machine learning algorithms don't have feelings unlike us humans, we can assume that they are impartial and unaffected by bias like we do. The big question is can we assure that machine learning algorithms are unbiased and therefore can be used to perform sensitive tasks?

Evidence?

There have been some controversial incidents that challenge our assumptions that machine learning algorithms cannot be biased. The first and one of the most famous incidents would be the COMPAS scandal. COMPAS - Correctional Offender Management Profiling for Alternative Sanctions, is an AI-powered software used in US Courts to assess the likelihood of a defendant committing another crime in the future. The algorithm spits out a score which predicts the likelihood that a defendant would commit another crime and in some states, this score is given to the judge during sentencing hence it has a clear impact on the depth of punishments that are assigned to each defendant. Some investigative journalists at ProPublica, a non-profit newsroom launched a study of COMPAS scores and published their findings in their controversial article, "Machine Bias". According to that article, the incident that made them launch the study is the unfair scores two individuals (who committed similar crimes) got assigned to them. One of them was Brisha Borden, an African-American woman who tried to steal a bike parked on the street. When she was arrested, she had a prior record for some misdemeanors under her name. The other person facing the petty theft charges was Vernon Prater, a Caucasian man with a record of armed robbery and attempted armed robbery. When the COMPAS algorithm was consulted in both cases, it indicated that there is a high risk that Brisha would commit a crime in the future and a low risk that Vernon would do the same. After two years, Brisha has not been charged with a single new crime whereas Vernon was serving eight years in prison for theft. After noticing this, ProPublica journalists have analyzed 7000+ cases that took place in Florida in the years of 2013-2014 and checked how many people have really committed crimes over a two year period. This analysis showed that only 20% of the people that the algorithm predicted that would commit violent crimes actually went on doing so. They also analyzed how the algorithm has assigned risk scores to people from different races and how they ended up in two years after their risk score assessments. The statistics and analysis provided in the article suggests that there is a tendency in the COMPAS algorithm to falsely flag African-American defendants as high risk to be criminals in the future and flag white defendants as low risk. It was pointed out that there is a chance that African-American defendants are 77% likely to be flagged as a high risk of committing a violent crime in the future. However, after the story broke, the company that created the COMPAS algorithm, Northpointe, has criticized the methodology used by ProPublica in analyzing historical data of the defendants and added that they do not agree with the results or claims based on those results are correct.

Another one of those incidents is the case of Allegheny Family Screening Tool(AFST), a model to help social workers decide whether a child should stay with their family or not by predicting child abuse, which was suspected of tending to work in favor of rich families. In the article 'A Child Abuse Prediction Model Fails Poor Families' published in

Wired, author Virginia Eubanks talks about how the algorithm behind the screening tool can be biased. In Pittsburgh, whenever someone calls state child abuse hotline to report a case, the predictive analysis model is used to determine the level of risk the child is in and whether he/she should be removed from their family because of abusive environments. If the AFST risk score-from 1 (lowest risk) to 20 (highest risk)-is high enough, the case is referred to a caseworker for further investigation. According to Virginia, struggles of poor families like not having enough food, inadequate or unsafe housing are officially defined as child mistreatment and therefore, it can be difficult for poor families to hold on to their children. In the article mentioned above, the author explains the biased and untrustworthy decisions made by the predictive model with the example, two risk scores assigned for two children. First is a six year old who evidently may have been abused and may have been homeless at that time. The child negligence and abuse hotline of Allegheny County Office of Children, Youth and Families (CYF) received two separate calls about the child and after the second call, CYF decided to assess the case of this child using AFST score. The algorithm assigned a risk score of 5 to the case. Moving on to the second kid, who is a 14 year old who has been sleeping on a couch in the living room of his untidy home and in the cold, due to a broken door and a window. Unlike the family of the first child, his family had a long history with county programs. The AFST algorithm assigned a risk score of 14 to the second child. A higher risk score like 14 means that there is a big chance that the child will be removed from his family. In her article, Virginia points out that the program is flawed in making decisions since it failed the family of the 14 year old who was sleeping in the cold apartment because of their social status & living situation and it failed the first child by neglecting his desperate need for

help by assigning a low risk score.

Google has also been in the spotlight for biased AI applications. According to this article on Dailymail UK, the incident fired up back in 2016 with a Tweet from a student named Bonnie Kamona saying 'I saw a tweet saying "Google unprofessional hairstyles for work". I did. Then I checked the "professional' ones"'. With the Tweet, she posted screenshots of google image search results for 'unprofessional hairstyles for work' and 'professional hairstyles'. The difference shocked people worldwide since search results for unprofessional hairstyles for work were mainly of black women with their natural hair and results for professional hairstyles were mostly pictures of white women. Many people who saw this Tweet went on to search Google for hairstyles themselves in disbelief and found themselves with the same results that Bonnie did.

These are some of the most famous cases that are suspected to depict bias in machine learning algorithms. There could be dozens more cases like these where biased decisions made by machine learning algorithms can be unfair to some people, either directly or indirectly.

Remarks

I am a firm believer of the saying "A machine learning model is only as good as the data it is fed". After the Google image search incident mentioned above, the company responded saying "This is fundamentally a societal problem — there are persistent and problematic biases, and they're quite pervasive in the media, on the web, etc – meta-tagging their images with their own descriptions." and added "Search engines in turn reflect what's on the web. This is not unique to our search engine; Yahoo! and Bing show similar results". What this incident tells us is that the machine learning algorithms of Google image search were not biased; they just happened to stumble upon many articles where people discuss unprofessional hairstyles and have pictures of black women in them. In Layman's terms, the algorithms

view, what needs to be done to reduce bias from machine learning algorithms is to pay more attention to the data that are fed to models. In most times, just removing attributes that might lead to discrimination and bias (like sexual orientation, race, religious background, etc.) won't solve the problem ,as there is a chance for the model to create an understanding of the data that will cause the model to be biased from other attributes in the dataset. The best thing to do is to create a good understanding of the dataset you're feeding into machine learning models to reduce chances of it producing biased results. Also, new technologies like de-biasing models can be used to ensure that machine learning models are fair to everyone, regardless of their races, religions and genders.

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AI Business - Three notable examples of AI bias

LET'S AWARE OF THE CYBERCRIMES TO BE PROTECTED

Iresha Rabel

What is a Cybercrime?

Nowadays internet is a common word for everyone. With the increase of internet usage the technology has improved rapidly which brinh the world to a small global village. With that rapid growth of technology, while a number of areas were developed with many opportunities, it also brought number of unknown threats as well such as cyber-crimes.

By the definition, a Cybercrime is any criminal activity that involves a computer or a networked device or a network. The one who commit cybercrimes is called as a hacker or a cybercriminal. Cyber-criminals can be individuals or organizations who carry out these for profit, political or personal reasons and for the target of damaging the computers or networks.

Types of Cybercrimes

These are the most common types of cybercrimes.

■ **Hacking:**
Hacking is sending some illegal information and getting access to a person's computer or a network from a remote location without any authorization to do so. The Hacker uses sensitive data extracted from the hacked device or network to make profit out of it directly or indirectly.

■ **Identity Theft:**
This is a major problem for the people doing online transactions and using internet banking services. These criminals access a person's or an organization's bank details and other sensitive information to draw money from the bank or to do online transactions under victim's name.

- **Malicious Software:**
Internet based software applications that are used to get access to a system and sensitive information in a network. This can cause damage other computers in that network or steal data.

- **Phishing:**
Targeting a person through spam emails or any other form of communication pretending that it's from a legitimate institution to convince and individual to provide sensitive information such as passwords and bank details willingly.

- **Cyber Extortion:**
Holding an organization's network, website, computer system or sensitive information hostage until the cybercriminals meet their demands.

- **Crypto Jacking:**
Unauthorized access to a computer in order to mine crypto currency. Hackers do this by either getting the victim to click on a malicious link in an email that loads crypto mining code on the computer, or by infecting a website or online ad with JavaScript code that auto-executes once loaded in the victim's browser.

- **Cyber Espionage:**
Cyber espionage or cyber spying is the practice of unauthorized obtain of secrets and confidential information that is held by an organization or the government.

The goal of cyber spying is mostly to acquire intellectual property or government secrets due to gain profit or military operations.

Causes for Cybercrimes

Since the cybercriminals can earn huge amount of money in no time easily and since it's difficult to catch such individuals/groups, the number of cybercrimes is getting increased day by day. The criminals can commit these crimes because of the vulnerabilities in computers and computer networks.

- **Easy to access**
There are many possibilities to breach due to complex technology. Hackers can bypass the biometric systems, security firewalls using stolen access codes, retina images and voice recordings to get access to the systems.

- **Negligence**
Negligence of people over protecting systems opens the door to hackers to get access and control of the system.

- **Hidden backdoor programs**
When a computer or software manufacturer install a program that has been designed to access the computer remotely is called as a backdoor. A hidden backdoor is when this happens without user's knowledge. These hidden backdoors are a vast software vulnerability for a hacker with good knowledge of backdoors to access the affected computer and the networks that it is connected to.

- **Failing to control user accounts access privileges**
Many organizations don't control the software or resource access privileges for software users and give everyone the super user or admin level privileges. It's a great opportunity for a hacker to access the organizational data and systems easily using a user account that has admin privileges.

- **Unknown security bugs in software**
The software complexity is increasing more and more. There may be programming issues and conflicts in software that creates security holes and cybercriminals are really good in discovering and exploiting those security vulnerabilities.

How to be protected?

The number of cybercrimes around the world is increasing daily and unlike real world, cybercriminals don't fight each other. Instead, they improve their skills together and even help out each other with new opportunities. Therefore using only normal traditional security methods will not stop cybercriminals.

One of the best action to avoid cybercriminals getting access to systems is using the solutions provided by Cross-Domain Solutions. These solutions allow organizations to use a unified system that authenticates the manual and automatic transfers and access to information between trusted parties. These secured transfers cannot be intercepted and accessed by the users beyond those trusted parties. This keeps the network and the systems using the network vary safe.

Other than the Cross-Domain Solutions, below are the primary security precautions that can be followed by the organizations as well as individuals to be protected from cybercrimes.

▪ **Using strong passwords**
Weak passwords can be easily cracked by hackers using different attacking methods. Always use different combinations of username and password for each account.

▪ **Encrypt the data in the network**
Protect organizational and individual data by encrypting the sensitive information always.

▪ **Secure the mobile devices**
Many people are not aware about their mobile device security and ignore about protecting it from virus and malware. But we should always install mobile applications only from trusted sources, install anti-virus software and use lock screens to protect sensitive information in our mobile devices.

▪ **Be safe from the Social Media**
We should always check the security settings of social media applications first and foremost and be careful about the information which is posted on social media.

▪ **Keep the computers updated with latest updates and patches**
By installing the latest updates and software fixes soon as they are available is one of the best way to keep the attackers away from our computer systems.

▪ **Control access privileges of software user accounts**
When there is very less limit of resources or information that a user account can access, there's only a limited chance of doing damage to a system using that user account. Therefore limiting the access privileges of software users is one of the major action that is done by the organizations to manage the software vulnerabilities.

▪ **Secure the computers with software protectors**
Security software essentials like anti-virus software and firewalls are necessary for basic online security. Firewalls controls the unauthorized access to the computer systems while anti-virus or anti-malware detect, prevent and remove virus and malware before it damages the systems

▪ **Contact the right party when victimized**
If someone is a victim already, the best party should be contacted for help. If you have encountered any illegal online content, suspect a cybercrime, commercial scam or identity theft there are some organizations to get help on cybercrimes (ex: Sri Lanka Computer Emergency Readiness Team)

In order to tackle cybercrimes effectively, multidimensional public private collaborations should be established between the information technology industry, Internet Service Providers, information security organizations, financial institutions and law enforcement agencies.

TRENDS IN SOFTWARE TESTING

Irushi Ananda

A second around the world is a set of tremendous changes and innovations. The software industry is one of the sectors which welcomes innovations and new technologies. So, "Quality" is the key factor of the software and product. There are numerous technologies, tools, trends for maintaining those rapid changes and innovations. Among those, let's focus on the top ten.

1. Agile and DevOps (Development and Operations)

Agile focuses on rapid changes and releases, customer feedback and collaboration since DevOps refers to the agile relationship between development and IT operations. DevOps involves practices, rules, processes, and tools that help to integrate development and operation activities to reduce the time from development to operations. So, both Agile and DevOps will develop and deliver the product faster with more quality.

2. Performance Engineering

Currently, performance Engineering is replacing Performance Testing. Analyzing how each component of the system works together takes high priority than executing test scripts. Thus, the main focus will be on architecture, design, and implementation.

3. Test Automation and API Services

Automation is the most trending and upgrading technique in the software QA field.

By using Test Automation, every organization can have several benefits like improve test coverage, faster software testing cycles, early detection of defects, reusability, cost-saving, time-saving, etc.

API and services are used for improving the functionality used by the end-users on UI. So, we need to have the right process, tool, and solution for API automation tests. API and services are reusable for multiple applications or components.

Ex: - SoapUI,Postman, Apigee, Rest-Assured, APImetrics, Karate DSL, Rest Console are some API tools. Selenium, TestDrive, QTP (UFT), Ranorex, Appium, TestComplete are some automation tools.

4. Mobile Test Automation

The trend of mobile app development is to grow and increase mobile devices with high capability and performance. This mobile test automation will help to track and maintain all testing needs, test coverage and high performance.

Ex: - Appium, Test Complete Mobile, Ranorex, SeeTest, Selendroid.

5. Integration of Tools and Activities

The integration tool is like a repository of data of various sharable and usable modules. We can verify each integration by an automated build to detect integration errors. By maintaining integration tools and following activities will help to optimize business processes, cost savings, etc.

Ex: - Test Rail, Improvado, CloverDX Xplenty QlikView Talend, Teamcity, Jenkins.

6. Artificial Intelligence & Machine Learning

AI and ML are the top up and going trends in the current QA society. To generate proper test cases, test scripts, test data, and reports, AI and ML algorithms are developed. Using Predictive models can make decisions about where what, and when to test. To detect failures, understand test coverage and areas of high risk, Smart analytics and visualization will contribute a big effort. In the future AI and ML will increase more automation, augmenting reality, optimize analytics, etc.

7. Test Environments and Big Data

To verify that the high volume of data is processed successfully with high velocity, we are using Big Data testing. Basically, it focuses on Performance and Functional Testing.

At present, testers are mainly concerned about testing maintenance, management and data storage of Big Data. Accuracy, validity, duplication, data completeness are some characteristics which checked as quality factors.

8. Digital Transformation

Since Digital Transformation is a kind of integration of digital technology, it has become an incredibly popular one in the IT industry. For better optimization of functional testing, testers will be required to figure out robust strategies in the field of digital assurance. Digitalization provides better customer insight and best practices.

9. Cloud-based testing tools

Another most ongoing trend is Cloud testing. It benefits of easy availability, high scalability, and low cost. From cross-browser testing to performance testing, testers and developers are going to take the help of cloud-based tools to fulfill their testing needs. Cloud QA provides a cloud testing environment to run tests on multiple platforms and real browsers.

Ex: - Test collab, SOASTA CloudTest, LoadStorm, BlazeMeter, Jenkins Dev@Cloud, Xamarin test cloud

### 10. Robotic Process Automation

Robotic Process Automation technology is built to perform critical and repetitive tasks at high speed. RPA will benefit system accuracy, productivity, reliability, consistency, etc. RPA is a user-friendly and cost-effective tool and worth it for business processes.

Ex: - LINX, Automai, WinAutomation, HelpSystems, KOFAX, OpenConnect

By using and following all the above mentioned and available trends are improving our software and product much more flexibility, productivity, efficiency, reusability, and quality.

CORONA EFFECT ON IT INDUSTRY
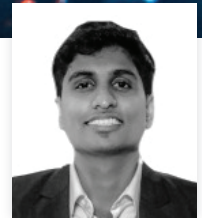
Abeeth Kotelawela

"Covid - 19", no matter where you live in the world, this virus is likely forcing changes to your everyday life. The same is true for businesses of all kinds, who has had to change vigorously as restrictions are put into action to slow down the spread of the outbreak. Throughout the process, much of the global economy has ground to a halt.

On a positive note, there is one industry that hasn't slowed down due to the pandemic. It is the global IT industry, which has shifted into high gear to accommodate the sudden demand for remote working and collaboration solutions as the majority of businesses have gone digital-only.

This change is so sudden and climactic, it is raising questions on how businesses will ever go back to the way they previously operated.

The only thing that seems certain, though, is that the IT industry will be profoundly changed by the crisis. It's forcing a widespread rethinking of what it's going to take to accommodate business technology needs as we move forward from the current situation. Building upon that, the following are most important ways the IT industry is likely to change as a result of the coronavirus crisis.

Stress Testing Becomes Routine

Every IT professionals and IT service providers have made sure to conduct regular stress testing of business systems which are critical to daily operations. Still, it's safe to say that the majority of VPN systems and remote access solutions were never a part of those tests since they weren't used by a large enough portion of the workforce.

For that reason, it's easy to predict that network-wide stress testing will become standard operating procedures for the majority of businesses and IT professionals. It's going to become necessary to make sure that services can handle a complete traffic reversal like the one that many businesses have now been forced to accommodate. It's a scenario that many never planned for, and the cost of failure in a situation such as this one could deal a death blow to many businesses.

Moves to the Cloud will Accelerate

Before the pandemic, global businesses did gradually shift from on-premises hardware into the cloud. Still, research indicated that most businesses had only shifted about 20% of their workloads into the cloud, with the remaining 80% remaining within on-premises legacy solutions. Needless to say, that has hampered the ability of many organizations to reallocate resources to support workers who are working outside of their offices.

It shouldn't take long after businesses start getting back to normal to see many attempts to move additional workloads to the cloud. It's the smartest way for them to gain the flexibility needed to handle any eventuality, as well as to decrease technology operating expenses going forward. It should also prompt many businesses that hadn't considered a shift to the cloud to do so, now that the many advantages of modern cloud solutions have been on very public display recently.

Businesses will pay for Redundancy

For most enterprises, having redundant technology solutions has always been a core operating principle to maintain business continuity. For that reason, network load balancing and standby systems are common in large network deployments. That kind of network redundancy hasn't been adopted in the vast majority of small to midsize business networks to date.

Going forward, both large and small, will be willing to pay for the kind of redundancy that used to be reserved for enterprises. That should also fuel a boom in the IT sector for companies to develop network technologies to support that demand, driving the price down to a level where even small businesses can afford to adopt redundancy.

Flexibility will become Standardized

Even before the coronavirus crisis, businesses of all kinds had started to embrace things like flexible work schedules and remote work policies to provide a better employee experience. That's even why so many businesses had turned to co-working spaces instead of permanent office space over the past few years. Businesses that did so also tended to embrace IT concepts like bring-your-own-device (BYOD) and remote working to help support their workforces.

After the coronavirus crisis passes, more businesses will rush to adopt standardized IT solutions to support BYOD, Working from home and other flexible technology initiatives. Instead of spending their IT budgets on company-owned devices, they'll start spending it on a management infrastructure to enforce company technology policy on employee devices instead.

Automation Technology will Boom

Recent advances in artificial intelligence (AI) and robotic process automation (RPI) have gradually made their way into businesses around the world. In many cases, the first exposure that companies have had to the technology has been in the form of marketing automation software. Larger organizations have even started the process of automating routine day-to-day tasks wherever possible.

In a post-coronavirus environment, it's almost a certainty that businesses will begin adopting automation wherever it is currently possible and will continue to invest in such technologies going forward, because it's the surest way to minimize future business disruptions like the one they're dealing with now. This could be made possible since computers aren't affected by global pandemics, and automated systems require only minimal maintenance and human intervention in most cases.

"A Whole Different IT Environment", as we move forward, it's going to be critical for all of the members of the IT community to work in tandem with the businesses they support to invent more specific long-term plans and strategies to handle an uncertain future. Many of those plans will include above listed points. Most will have to go a whole lot further. What's certain is that all of those plans will result in an IT environment that will bear little resemblance to the one it's replacing. How well it all works, of course, is up to all of us.

CLIENT EXPERIENCE AT EMBLA

Interviewed by
Govindinee Attanagoda

Govindinee : Could you brief the nature of your business?

Rune : Agrando creates and provides easy-to-use church management software to streamline operations, to improve communication and collaboration. We, Agrando offer industry-specific software solutions for the management and operations in churches in the Nordic countries. In our line of business, we are the largest company in these countries.

What is the role of Embla ?

Our team puts a great effort into the whole development process, including sprint planning, UX design, front-end development, backend development, manual and automated tests, and deployments of the projects.

How and when did you hear Embla for the first time?

I believe it was in 2012 that Stein Inge was in Norway to promote Embla and paid a visit to our office in Sandnes.

What is the most valuable part of doing business with us?

The long-lasting and successful partnership that we have established over the past years with Embla is highly valuable to us.

You have been with us for several years, so how do you see Embla today compared to then?

Mainly, I can say there are better facilities when compared to the early days, back in 2012, including infrastructure, power supply, and internet connections.

Those have helped us greatly to form a powerful and strong partnership over the years. My impression is that Embla has grown to be more professional throughout the organization.

How is our team doing on your project?

For me it is important, and I will strive to make the projects not only Agrando Norway projects but also our common projects as well. The team works hard every day to deliver high-quality applications.

We are currently working on multiple projects and we have been through a change of technologies. The team members

have done a great job of acquiring new knowledge. Through this, we also have seen the advantage of Embla with their multiple teams that allow us to get synergy effects with the experience of transfers between teams. Since we have team members that have been with us for many years, we have maintained good domain knowledge in the team.

What is your opinion on practicing agile process within the team?

We haven't had a chance to use agile development processes in Agrando before we started the partnership with Embla. So it has been a challenging methodology for us, changing from where we were and adhering to agile methods that work for us. Mainly, we do run 2 weeks' sprints, and frequent demonstrations to product owners give the possibility for early feedback and opportunities for change. We also have found by breaking down user stories into smaller tasks, and setting effort points on these tasks are helpful. It has been easier to predict when the applications would be ready for release.

As you see, what are the strengths of Embla?

- Embla has an inspiring and friendly working environment.

- A lot of skilled and talented people

- Multiple Teams that work with a wide spectrum of technologies.

- Knowledge transfer between these teams.

- Employees who have been with the company for many years have considerable knowledge of the company's culture and its products and services. With this experience, they have come to understand what works and what doesn't, which results in higher productivity.

Could you sum up your client experience at Embla in few words?

Great Team, Friendly people.

MULTI-FACTOR AUTHENTICATION

Nishani Gunapala

We are in 2021, the most challenging time humankind has ever faced. The Coronavirus pandemic has affected the ways that we work, learn, shop and bank. It has triggered a boom in remote working environments and dependency on cloud-based technologies than ever before. Due to that companies and their user accounts translate to more opportunities for account compromise. Even though username and password is unique and personal, people tend to use the same password across many applications or using easy to guess passwords or some applications may store plain text passwords which are easy to breach.

In earlier days to overcome these issues most of the applications has introduced strong passwords like,

- At least 8 characters—the more characters, the better
- A mixture of both uppercase and lowercase letters
- A mixture of letters and numbers
- Inclusion of at least one special character, e.g., ! @ # ?]

Even strong passwords prevent identity theft to certain extent, more than ever, it's important to focus on additional ways to protect user accounts. A good way to provide an extra level of security above and beyond passwords is to introduce multi-factor authentication (MFA)

> "It is - unbelievably - true that the most popular password of 2020 was 123456 and 'password' appears at number four."

What is Multi-factor Authentication?

Multi-factor authentication means considering additional factors to authenticate users in addition to the username and password to log into an account. Mostly used as Two-factor authentication. In Multi-factor authentication, once after verifying username and password user has to go through one or more verification paths to acquire the access.

Most widely used factors for validating a person's identity can be grouped into three major categories:
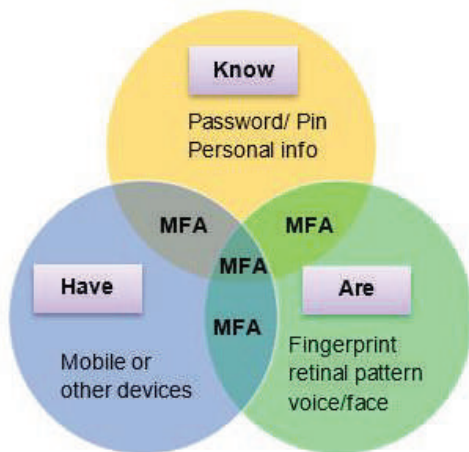
Something that you are:
Identifying a person from unique and non-changing attributes. Fingerprint is the most commonly used attribute under this category. Apart from that face recognition , retinal scan, or even your speech or typing patterns

Something that you know:
This is focusing on unique knowledge that person got. Password is the most commonly used attribute. Other than that personal information like date of birth, family details also fall under this category.

■ **Something that you have:**
the trending form of verifying identity of a user. It's much less likely that a hacker has stolen your password and stolen something physical from you. This category includes mobile verification, physical tokens, key fobs and smartcards etc.

There are several ways we can implement multi factor authentication based on the above categories, and based on the requirement, authentication mechanisms may vary in different companies.

Most companies introduced multifactor authentication to provide additional security to their user accounts. Applications related to high sensitive data and transactions are forcing users to enable multifactor authentication. Nevertheless most applications provide multifactor authentication feature as an option for user to select in order to improve the security.
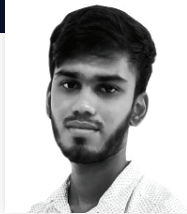
CONVOLUTIONAL NEURAL NETWORKS

Sahan Jayasinghe

What are Convolutional Neural Networks?

Convolutional neural networks (in short CNNs or ConvNets) are deep learning algorithms which are heavily used in image classification and object detection sectors. These networks are capable of assigning importance to various objects in an image and differentiate the identified objects from one another. CNNs consist multiple convolutional layers where the mapping between these layers is performed by some special matrices called 'filters' or 'kernels'.

Why do we need CNNs?

We can easily configure a normal feed-forward neural network which is also a multi-layer network for cases like housing price estimation, cancer recognition from the symptoms. Why can't we just do the same for a case like image classification where categorizing a given image as a dog's image or a cat's image? We all know that the RGB images are represented as 3-dimensional arrays. So, can't we just provide this 3-D array as input to our neural network and do the classification? Let's see how that approach works out.
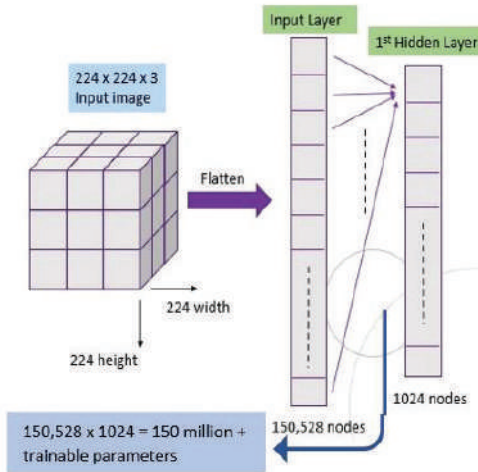
Above diagram emphasizes a scenario where a 224 x 224 resolution RGB image is provided as input to a feed-forward neural network. If we choose the 1st hidden layer of the network to contain 1024 nodes, the number of parameters which do the mapping between these two layers will exceed 150 million. It will be impossible to train the model for better predictions due to this complexity. Another issue with this approach is that the assignment of weights for each pixel value is highly redundant since the objects in an image is made up of a group of co-related pixels.

Due to these reasons, CNNs have become the best in business when it comes to handling large inputs with co-related features such as images.

The special ability of CNNs is that they can capture the spatial and temporal dependencies in an image with the use of Convolution Operation.

Representation of RGB Color Image

Before moving on to see how the CNNs work, let's understand the matrix representation of a RGB color image.
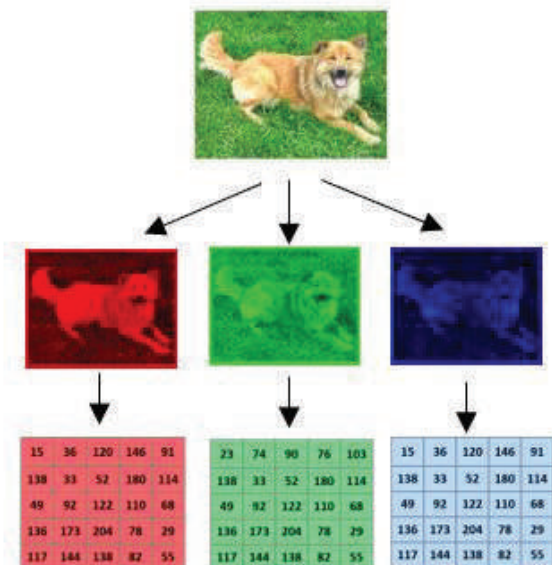
For simplicity, let's consider the resolution of above image is 5 x 5. Since a color image is a combination of red, green and blue color channels, each color channel is represented by a 5 x 5 array of pixels where each pixel value is in range 0 to 255. So, the image matrix has a shape of 5 x 5 x 3.

Convolution Operation on a RGB Color Image

A special matrix called as Filter is used to perform the convolution operation. Since the input image consists of 3 layers corresponding to 3 color channels, the filter should also contain 3 layers. The width and height of each filter layer should be same or less than the input image width and height. Let's see how this operation is performed on the sample image (5x5x3) that we referred previously, using **a filter of shape 3x3x3.**

Image Layer **R**

Filter Layer **R**

$$3x2 + 3x(-1) + 1x0 + 5x0 + 5x1 + 3x(-1) + 5x1 + 2x1 + 0x0 = \mathbf{12}$$

Image Layer **G**

Filter Layer **G**

$$0x(-1) + 1x0 + 0x2 + 3x1 + 0x0 + 2x0 + 2x1 + 2x(-1) + 0x(-1) = \mathbf{3}$$

Image Layer **B**

Filter Layer **B**

$$1x0 + 0x1 + 1x(-1) + 2x(-1) + 2x1 + 5x2 + 3x0 + 4x2 + 3x0 = \mathbf{17}$$

Each filter layer is applied to the area marked with the thick border inside the respective color layers. As you can see, there are 9-pixel values inside the marked area which corresponds to the 9 values inside the filter layer. The convolution operation on the marked areas of the color layers is performed by taking the multiplication of corresponding filter values in each cell with the overlapped value in the marked area and adding those 9 values together.

So, the convolution output for the area marked with the thick border inside the 3 color layers is taken by adding the result from each color layer along with a bias value. For now, we will consider the bias value as 1.

$$12 + 3 + 17 + 1 = 33$$

For the selected area (marked with the thick border) of the 3D image, for the given filter, the convolution operation output is 33.

Now we know how the convolution works on a selected area of the input. Convolution on the whole image is performed by moving the filter along the width and height of the image starting from the top left corner. We can define the *width stride and height stride to control the sliding of the filter.*
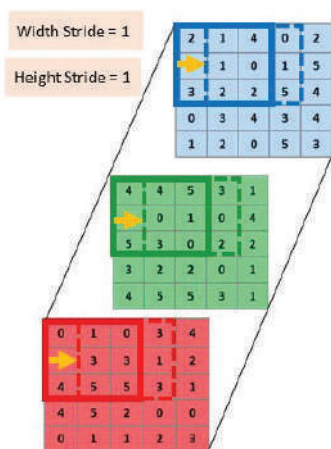
For this example, Let's consider the width and height strides are 1. Starting from the top left corner of each color layer, the corresponding filter layers move along the width with a step of 1 providing the convolution output at each overlapping area of the image. When the filter reaches the right end of the image, it comes back to the left corner and moves down by 1 step since we defined the height stride as 1..

Then again, the filter performs the convolution moving from left to right through the width. Final output of the convolution performed by the filter is recorded as below.

Output matrix of the convolution performed by **3x3 filter** on **5x5x3 image**

Output is of shape 3x3 since the convolution result at 9 overlapped areas of filter over the image is recorded in a 2D array with respect to the position of the filter. For an example, the top left cell of the output matrix represents the convolution result when the filter is at the top left corner of the image.

Even though our RGB image is of 5x5 resolution, after the convolution, the output is reduced to a dimension of 3x3. To avoid this dimensionality reduction, a padding is added to the input before performing the convolution.

Above diagram shows the blue color layer with 0-padding applied around the original input. In the same manner, 0-padding is applied to red and green color layers as well. The convoluted output for the padded input with the same filter we previously used, will be of shape 5x5.
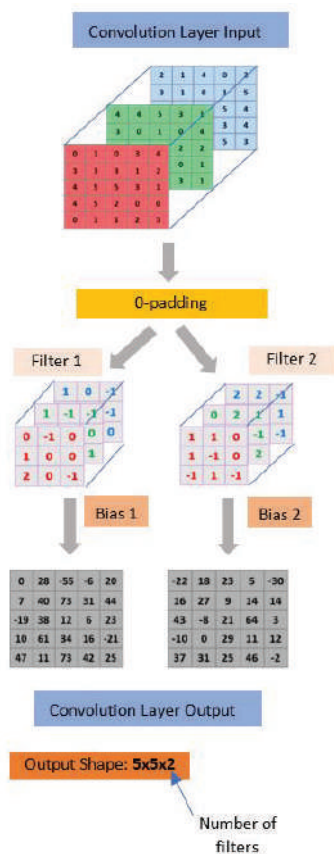
Convolution Layer

A convolution layer takes in an input matrix (passed from previous layer of the CNN) and perform the convolution with the filters defined for the layer using the defined width and height strides and provide the output to the next layer of a CNN.

Let's understand the operation of a convolution layer using the 5x5x3 image as the input. We will define the number of filters to be 2 and width and height strides to be 1 in this particular example.

To preserve the input dimension in the output, we will add 0-padding to input before performing convolution.

Above diagram displays the filters in 3D shape since there are 3 filter layers corresponding to each color channel of the input. A bias value is also assigned with each filter to add to the convoluted value of each cell.

The convolution layer provides the output of dimension 5x5x2 since the input matrix is convoluted using the 2 filters separately providing a 5x5 output matrix from each.

In a CNN, the filters and bias values in convolution layers are the parameters that are being trained to provide better outcome.

CNN Vs Feed Forward Neural Network

Considering a 224x224 RGB image as the input, in the feed-forward neural network that we have discussed earlier, there were more than 150 million trainable parameters for the 1st hidden layer. But when it comes to CNN, if we use 8 3x3 filters, there are only 80 parameters to train for the 1st convolution layer.

Convolution results in highlighting specific localized image features (like edges) that can be used later in the network for a detection or classification task.
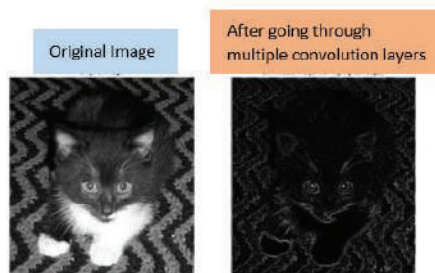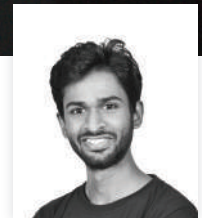

Wide use of Convolutional Neural Networks can be seen in Computer Vision projects such as image classification, object localization, object detection and instance segmentation.
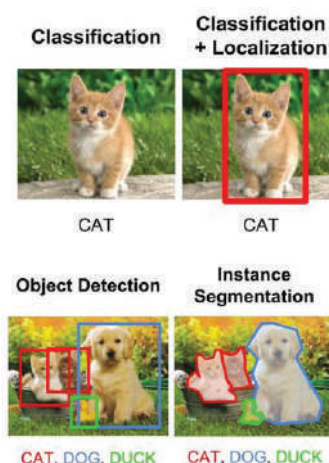
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- Intro to Tensorflow for Deep Learning
- A Comprehensive Guide to CNN
- Intro to CNNs

COMPUTER-DRIVEN FLIGHT INSTRUMENTS

Sanka Cooray

The modern aviation industry is using a large number of automated digital systems to ensure accelerated safety flights. Those computer-driven devices are not only used in aircraft but also in the Airport and in ATC (Air Traffic Controller). Older communication and flight control systems have now become obsolete but are they reliable than modern high tech instruments? Can we trust computer decisions than human decisions? Humans error is almost zero due to these computer controlled systems precision but mechanical errors and maintenance failures may still lead to a catastrophic aviation failure.
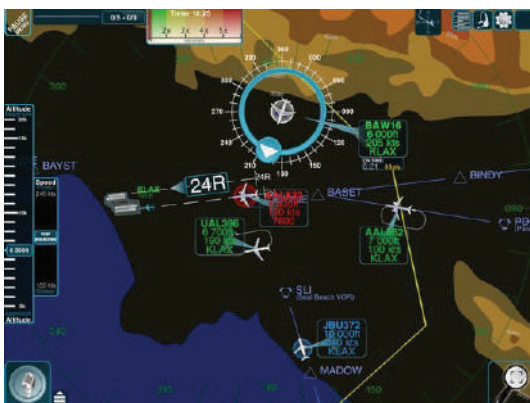
Auto Pilot

Unlike early days, today, most of the passenger jets and cargo aircraft can be landed safely using computer-driven autopilot system. Modern airplanes are using ILS (instrumental landing system) which is continuously communicating itself over radio frequencies and getting navigation information from airport approaching runaway. So the landing phase can be fully automated because of the trusted accuracy and real-time navigation. This system is very useful in such situations like low visibility (ie fog, rain), Both pilots are sick. In some contexts, pilots are still required to handle difficult situations like turbulence and to monitor other instruments. While most the airlines prefer manual landing some airlines have made autopilot is mandatory during the landing phase.

TCAS

TCAS (Traffic Collision and Avoidance System) plays a major role to prevent mid-air collisions which are the most dangerous accidents in aviation history. This system presents in almost all modern aircraft. TCAS is an independent computer which is continuously monitoring obstacles in its current air space. As soon as it detects another aircraft approaching in a collision route, the system activates a warning message to pilots and also giving an audible message saying "Climb Up", "Descend", "Turn left" or "Turn right" based on the situation. Since this system communicates with second airplanes TCAS, it can automatically generate opposite actions. While the first plane receives "Climb Up" order, the second plane receives "Descend" order. TCAS is almost similar to modern ground vehicle auto brake system. Both of them trying to avoid collision between two moving objects. The difference is ground vehicles are moving on a 2D plane (ground) so the sensors do not care about the 3rd axis (unless cars are flying). Aerospace is completely 3D so the airplanes can move any direction in any speed. So the TCAS has a very responsible duty to avoid a mid-air collision. Several years ago, TCAS became the standard and most accepted collision control system which is a completely automated computer system because there was a famous mid-year collision incident in aviation history due to a human error.

Black Box

A flight data recorder is an electronic device employed to record instructions sent to any electronic systems on an aircraft.

Blackbox is a very valuable device because of its functionality. Basically, it is a digital recording system installed inside aircraft. This system consists of two components, FDR and CVR (Flight Data Recorder and Cockpit Voice Recorder) and they are mainly used to investigate an air crash incident. After a catastrophic air crash, everyone first looks for the red colored so-called "Blackbox". CVR is recording voices in the cockpit including the captain's voice, co-pilot's voice, and even some small engine sounds and electronic system audio feedback. FDR records all the flight instrument parameters collected per second. (Ex: current heading, altitude, airspeed, autopilot status, etc)

This FDR can be played in a flight simulator (like watching a game trailer), so it will simulate the actual behavior of the aircraft starting from takeoff to crash landing.

Flight Simulators

Flight simulators are playing a major role in pilot training programs. Modern passenger jet cockpit consists of 6 windows. Flight simulators contain 6 display monitors to simulate these windows. Immersion is almost similar as if you are flying an actual aircraft. It simulates computer-generated visuals, engine sounds, audio feedback, and even vibrations and haptic feedback.

In most advanced flight simulators you may feel acceleration and rotation as well. Flight program (software) is providing additional outputs for motion actuators hence providing 6DoF motion (positional changes and rotational changes).

Flight simulator cockpits are usually mounted a few feet above the ground and attached with a couple of actuators.

Links

Don't Freak Over Boeing's Self-Flying Plane-Robots Already Run the Skies
Boeing just got into the autonomous aviation game, with the goal of building jetliners that fly themselves, no pilots...
www.wired.com

Aviation cyber crimes

Modern aircraft are highly computerized flying machines. There is a possibility for hackers to override the in-flight computer systems which will lead to numerous activities like an unplanned landing to a fatal disaster. Luckily most of the in-flight computer systems are isolated from the outside world. Even the passenger entertainment computer systems are isolated from the cockpit systems. So we can trust these systems to a certain level. The problem could arise after a few years. Since the normal service span of a passenger jet is approximately 30 years, think about the situation having both newborn high tech jets and old jets together. Older jets may have fewer security firewalls because the technology is relatively behind to modern technologies.

System failure vs Lack of training

A recent crash incident (Ethiopian flight — on March 10) made all the "boing 737 max 8" airplanes grounded and stopped their operation due to safety concerns. Boeing has made a fuel-efficient model so most airlines all around the world bought that model. Experts first believed the crash cause due to lack of training on this new model. New 737 max computer systems are different than their former models. The major problem was Boeing trusted machines than humans. For each computer-driven automation system, there should be a way to override by a human. New 737 model has a hidden computer system called MCAS which caused the crash. The computer system is accurate but its sensor was faulty, hence feeding wrong input data and MCAS was doing its primary job without informing the pilot. So the autopilot has overridden both pilot flying and pilot monitoring.

Conclusion

The modern aviation industry is totally based on computer systems and all the individual elements are using at least a single computer system. These systems precision is improving rapidly and newer systems replace its predecessors very often. Most of the system improves the quality of traveling but occasionally creates some problems.

FRESHER EXPERIENCE

All fresh graduates in IT steps out from the university, having hands on a dream to begin their professional career at a place where they could sharpen up their professional career. I'm lucky to say that I could be able to make that dream a reality by joining Embla as a Software Engineer in August 2018. It was a great opportunity for me to be a part of this amazing place and believe that it was the best decision I have ever made.

At Embla new technologies, innovative ideas are always welcome. It tends to provide significant exposure to enhance the professional career of a developer. Direct client interaction that I'm able to experience is a rare opportunity for a developer who is a fresher to the industry. There is always room for personal developments of employees through continuous feedback from the team members. Most importantly the contribution through tech talks, lightning talks and geek sessions where the employees can actively participate, is tremendous that enhances technical and communication skills.

Sasini De Silva

In my perspective unique attribute of Embla is having a pleasant working culture which makes employees motivated with fun and equality. This working culture is empowered by the various clubs which facilitate employee well-being and development, irrespective of the hierarchy.
With the great experience so far I had as a fresher at Embla, I believe that Embla is the best place for a fresher to start a professional career as a developer.

INTERNSHIP EXPERIENCE

As a software engineering student at Kotelawala Defence University, I got an opportunity to complete an internship at Embla Software Innovation .I am really happy I decided to work here. My internship experience has taught me more than I could have imagined.

In the first month of my internship I was assigned to an internal project to adhere to Embla process and technology stack. My mentor and team members gave me advices and guidance to complete tasks assigned.
After one month of time I was assigned to a client project which gave me an opportunity to work directly with Norwegian client.
Most interesting thing at Embla is to witness by weekly Tech Talk,

Hashan Pallewatta

Lightening Talk or Geek session which we can gather vast knowledge not only in technologically but also in personal development.The internship was beneficial to me for a number of reasons. To begin with, I learned basic responsibilities of a job such as commitment, punctuality and interpersonal communication. Furthermore, the networking opportunities has helped me to develop strong bonds today.

The growth, grit, and drive that is gained at Embla cannot be learned in another organization. This Internship was a valuable learning experience for me because it allowed me to be independent and build my self-confidence. Overall, my time at Embla exceeded my expectations and taught me various values and it's a great place to start a good career path.

Odatha Sachinthanie

One of the greatest opportunities I gained as an undergraduate student is being an Intern at Embla. Embla was a great impact for me to build strong foundation for my carrier path. Embla has an innovative, challenging and modernized culture where I was lucky enough to have my first but the best industry experience.

We were assigned to work in real projects, but not in the dummy projects which is a rare opportunity for an intern where we contributed to build real business products that gave us a great self-satisfaction to see our work in real production. One of the best things at Embla is its people. My team members helped me to accustom to the environment with a massive support and guidance by having a continuous supervision. Specially they gave me the technical exposure on full stack and assigned responsibilities to participate and collaborate in the project life cycle. In addition, for the first time in my life I had an active interaction with foreign clients which is a rare opportunity as a fresher to the industry.

Free and relaxed environment at Embla motivates the personal development through number of events and club activities organized throughout the year where we all work, enjoy and share the life at Embla as a

family. When you are a member of Embla your carrier progression is inevitable as it is always supported through tech talks, lightning talks, geek sessions and many more. For the six months of my internship period I had the best hands on industry experience as a developer and Embla is the best company in Sri Lanka for an IT undergraduate to have their internship.

As we all know "A journey of a thousand miles begins with a single step". Almost every student in the faculty of information technology at University of Moratuwa starts their journey to end with a successful internship. Each and every student gain a different set of skills from the internship based on the company joined. These skills may change our careers in an unimaginable way. So the company we do our internship matters a lot as an IT student. I am very proud to say that the internship at Embla gave me a head start for my career. Embla internship program focuses on giving knowledge on every aspect of software development including software development processes, cutting edge technologies, frameworks and interpersonal development. As an intern at Embla, I had the opportunity to work on SCRUM

Chamath Sandaru

software development process in an ongoing project with senior developers and senior scrum masters, who taught me many innovative ways they used to overcome some practical barriers of pure SCRUM process. Embla has projects with a wide variety of technologies which can be highly beneficial for a student who seeks knowledge and starting their software development career. During the six months internship period, I worked with many interesting technologies such as webrtc, mediasoup, angular, electron, node, codeceptjs, jsx and applescript.

In my opinion, generous, passionate and creative professionals are the most valuable asset a company can afford. Most interesting thing about people at Embla is their way of caring for others. Embla always make time from their busy schedules for others in any case of technical or personal difficulty. They guided and helped me throughout my internship period. I think the amazing clubs at Embla and the flat hierarchy of the company empowers people towards greatness. These clubs ensure employee well-being and their professional enhancements. As an intern, I also had the opportunity to participate in tech talks, lightning talks, geek sessions and monthly code challenges to gain technical and professional knowledge. Furthermore, events at Embla helps to build strong connections between employees. Among all of those events, I had the opportunity to participate in multiple fun filled events including Halloween night, year-end party and embla premier league. The connections I made in those events made the internship period more stress less and comfortable.

Finally, I am so grateful to Embla for all the advice, knowledge and memories that I have gathered during that short time period.

HAPPY NEW YEAR

VALENTINE 2020

WORKSHOP SCRUM 2020

CRICKET MATCH 2020

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