# TensorFlow Commemoration Smart Devices Retaining Remembrance Digitally

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**Abstract:** TensorFlow technology was developed by the Google Brain Team and it has been taking the technological advances of Artificial Intelligence to a whole new level. As the Brain Team itself acclaimed - TensorFlow doesn't solve the problem, but gives the user the toolkit to abstract away from academics of a convolution neural net and use one to solve the problem. Based on this emerging technology many organizations have been building their business model services and have been receiving unbelievably excellent results. This paper highlights the concept of utilizing the TensorFlow technology to build commemoration devices. Commemoration device is taking the relational data storage technique a stage further where the user exercises the liberty storing the memories by correlating them in certain predefined pattern so that when the user retrieves them later; a web of digital memories correlated to it is also retrieved for lucid data utilization.

**Keywords**: TensorFlow ,Commemoration ,Artificial Intelligence, Augmented Reality, Cloud Computing,Data storage and retrieval, Neural technology.

## Introduction

TensorFlow Commemoration smart device corroborates the concept of device memory, artificial intelligence, timeline reviewing and data management, and integrates them on any device regardless of what platform it's functioning on.

With increasing social media interaction the amount of digital data coined as digital memory has increased in preponderance, remembrance of which is just about insatiable for an average human brain.

Commemoration technique is vital for such a complexity. It enables the user to store memory by correlating them in certain predefined pattern so that when the user retrieves them later; a web of digital memories correlated to it is also retrieved for lucid data utilization. Along with commemoration, another discernible feature enabled in this system would be of Image classifier and Ontology. The user need not enter tags for searching any data; a scanned image of any string related to the large web of digital memory would be adequate for the entire web retrieval. The optimization of searching and retrieval of the system is akin to Search Engine Optimization technique adopted by accomplished search engines, with the added flexibility of laconic search tags and digital search.

Through this paper these ideas will be stringed together and presented as an integrated system.

## About The Tensorflow Technology

TensorFlow is an open source software available with a plethora of library for numerical computation and operations using data flow graphs and hieroglyphics.

Nodes in the graph are symbolic representation of mathematical operations, while the graph edges represents the multidimensional data arrays communicated between them. Multidimensional data arrays are the tensors and they'd be useful for recording relational data in the database. The flexible architecture and structure of TensorFlow allows the user to deploy computation to one or more CPUs or GPUs in a desktop, server, or mobile device with a single API. It's simplicity and easy to understand structure makes it a plaudit technology.

TensorFlow was originally developed by researchers and engineers working on the Google Brain Team within Google's Machine Intelligence research organization for the purposes of conducting machine learning and deep neural networks research, but the system is general enough to be applicable in a wide variety of other domains as well.

## Ideas based on Tensorflow

TensorFlow is an artificial intelligence engine that Google has been using in many of its products. Google caused a whisk when it open sourced its TensorFlow software back in November 2015, and the technology is starting to make its way into the mainstream. By making it freely accessible recently, it enabled others to perform some neat tricks, including translating English into Chinese, reading handwritten text, and even generating original artwork. The TensorFlow libraries

explicate integrated self-learning elements and AI characteristics like speech recognition, computer vision or natural language processing into applications. A network "learns" as the sensitivity of these neurons is tuned to counterpart particular input and output, and having various multitude layers makes it plaudit to identify more conceptual characteristics, such as a face in a photograph. By open sourcing the TensorFlow's library of machine learning code, Google is easing out the complex deep neural nets by its simpler construction, training and deployment. A neural network comprises of layers of virtual neurons that fire in a surge to counter the input. TensorFlow, provides a uncomplicated way for programmers to train computers to perform tasks by empowering them with large amounts of data. It incorporates various methods for competently structuring and guiding simulated "deep learning" neural networks athwart diverse hardware. The machine learning automated software library is the next generation of DistBelief, which was internally developed by the Google Brain team at the search giant for a preponderance of tasks such as image search and enhancing its speech recognition algorithms. The Google Brain helped develop Smart Reply, a system that automatically recommends a quick response to messages in Gmail after it scans the text of an incoming message. TensorFlow is a deep neural network, so it instructs itself to perform a task through positive fortification and works through stages of data (nodes) to assist it in determining the correct outcome.

According to the TensorFlow organization some of the biggest companies in the world are using the software library, such as Airbnb, Airbus, Dropbox, Snapchat and Uber.

These include software that generates captions for images and code that translates the documentation for TensorFlow into Chinese. Another project uses TensorFlow to generate artificial artwork. Deep learning is an extremely effective technique for training computers to recognize patterns in images or audio, enabling machines to perform with human-like competence useful tasks such as recognizing faces or objects in images. Recently, deep learning also has shown significant promise for parsing natural language, by enabling machines to respond to spoken or written queries in meaningful ways.

One of the company vocal about its use of TensorFlow is an UK based online supermarket Ocado. The data science team there is using the libraries for routing algorithms, for its robots to move around warehouses, to improving its existing features like demand forecasting, which is currently based on decade-old linear regression models, and predicatively suggesting items to add to your basket depending on past shopping habits. Ocado is a Google shop, using the search giant's Big Query in the Google Cloud for much of its query and storage needs. Deploying TensorFlow with Google certainly makes things far easier for such organizations.

## Psychology of Commemoration

The ability of human brain to store and retrieve information is completely ineffable. Smart devices and modern day storage techniques are inspired and modeled by closely observing the human brain and the artwork of strategically remembering various information.

The most efficient method of remembering various people, their name and their facial characteristics, deployed by the human brain is to create visual memories. Selecting a single defining visual characteristic of each person and connecting it to a visual representation of their name, preferably through an action of some kind makes it easier for future remembrance, proving that memory is predominantly visual.

Creating a mental memory tree when trying to memorize a large number of facts, finding a way to relate them in your mind visually with a memory tree is where the concept of commemoration engenders. A digital memory constructs big branches first, and then leaves. Branches and leaves should carry labels that are a reference to logical and conceptual information.

Information termed as the memories of users pop up involuntarily and share a lot in common with those recalled voluntarily, including being equally vivid.

User's Memories arrive in a series, called a Memory Chain, and may be either time-related or concept-related. Spreading activation--the notion that an activated memory will spread to and bring up related memories. This concept becomes important when data storage and retrieval is concerned at a multitudinous level.

For example if a user creates a memory in form of certain information. Chances are, the features they chose to remember that first moment will be vital as they are used as memory triggers each time they go back to the information, they will in time grow larger, more definitive, more important. And those features that they decided were not worth recording will fade in comparison. They may shift; they may grow indistinct; they may disappear altogether until they don't remember they were there to begin with. Whatever happens, the memory triggers will change. The shift can be more or less perceptible, more or less important to the essence of the moment, but it will inevitably take place.

Since the discovery of the importance of the hippocampus for normal memory, considerable research has endeavored to characterize the precise role played by the hippocampus.

In a recent report the role of the hippocampus in all manner of relations, supporting this claim with the finding that amnesic patients with hippocampal damage were similarly impaired on probes of memory for spatial, sequential, and associative relations was emphasized.

In the context of Neuroscience, Relational Memory also known as Declarative Memory is the name we give to the kind of memory that stores and recalls the relationships and associations between two or more percepts, such as objects and/or events. Those relationships can be: co-presence in space, co-occurrence in time, greater or lesser distance in

either time or space (or both), and some other derived, "higher level" relationships and associations such as cause/effect. That's the precise situation where need of commemoration devices arises.

## Tensorflow Commemoration Smart Devices

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Digital Libraries would be used for storing these memory chains.

When the user builds a memory that is creating or feeding any information, the integrated commemoration searches for pre-stored memory chains which it could be linked to.

Pattern Recognition is a mature but exciting and fast developing field which is an another important feature being used in data storage techniques. It underpins developments in cognate fields such as computer vision, image processing, text and document analysis and neural networks. It is closely akin to machine learning, and also finds applications in fast emerging areas such as biometrics, bioinformatics, multimedia data analysis and most recently data science. The journal Pattern Recognition was established some 50 years ago, as the field emerged in the early years of computer science. Over the intervening years it has expanded considerably.

For example if on the TensorFlow Commemoration enabled smart device of Sarah, an image of Sarah and Johannah is clicked, it will relate this memory to the contact name and email address of Johannah, pre stored in Sarah's device cloud storage.

Digital library is a metaphor for access to collections of electronic documents through a network. The classic research area dealing with the electronic search for documents is Information Retrieval.

To access any of these memories information retrieval algorithms are applied.

Information Retrieval has to leave the controlled and uniform conditions of professional information providers. It is confronted with a vast variety of servers, formats, indexing strategies, and query mechanisms.

This is where TensorFlow comes handy with its ambiguous pattern and voice recognition tools. The user is provided with an interface where a query in the form of a text, image, voice or multimedia is accepted and the entire memory chain related to it is adumbrated.

Continuing the example if later Sarah needs to retrieve the information of Johannah she can either type her name, or go for a face recognition technique or a voice search and all the information related to Johannah, including her contact details and the images tagged with her name are retrieved.

Along with commemoration, another discernible feature enabled in this system would be of Image classifier and Ontology. The user need not enter tags for searching any data; a scanned image of any string related to the large web of digital memory would be adequate for the entire web retrieval. Most retrieval sessions consist of a series of searches each based on the results of previous attempts. During this interaction the user elaborates his/her query. For many inexperienced users the cognitive load of managing the search and scanning the documents found is very high. In a Digital Libraries environment the situation will be worse due to the heterogeneity of the various systems and servers. To help users in this situation we develop a Dialog Management System that keeps track of the interaction; it is able to offer context specific interpretations of user actions and propose further steps in a context sensitive way. The system is based on the linguistic dialog model COR (Conversational Roles) and generic strategies for typical retrieval situations.

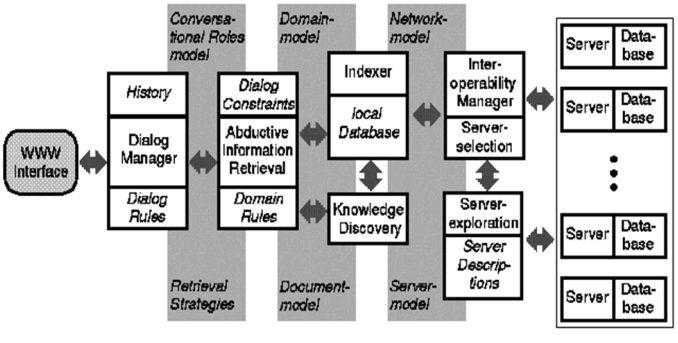


Fig 1. Distributed Digital Library Retrieval Model

The growing popularity and development of data mining technologies bring serious threat to the security of individual,'s sensitive information. To counter this threat Privacy Preserving Data Mining (PPDM) is deployed in this model. Privacy preserving data mining refers to the area of data mining that seeks to safeguard sensitive information from unsolicited or unsanctioned disclosure. Most traditional data mining techniques analyze and model the dataset statistically, in aggregation, while privacy preservation is primarily concerned with protecting against disclosure of individual data records. This domain separation points to the technical feasibility of PPDM.

Currently PPDM mainly focus on how to reduce the privacy risk brought by data mining operations, while in fact, unwanted disclosure of sensitive information may also happen in the process of data collecting, data publishing, and information (i.e., the data mining results) delivering. In particular, the four different types of users involved in data mining applications are identified, namely, data provider, data collector, data miner, and decision maker. For each type of user, their privacy concerns and the methods that can be adopted to protect sensitive information are discussed.

When we store information in some kind of circuit or device, we not only need some way to store and retrieve it, but also to locate precisely where in the device that it is. Most, if not all, memory devices can be thought of as a series of mail boxes, folders in a file cabinet, or some other metaphor where information can be located in a variety of places. When we refer to the actual information being stored in the memory device, we usually refer to it as the data. The location of this data within the storage device is typically called the address, in a manner reminiscent of the postal service.

With some types of memory devices, the address in which certain data is stored can be called up by means of parallel data lines in a digital circuit (we'll discuss this in more detail later in this lesson). With other types of devices, data is addressed in terms of an actual physical location on the surface of some type of media (the tracks and sectors of circular computer disks, for instance). However, some memory devices such as magnetic tapes have a one- dimensional type of data addressing: if you want to play your favorite song in the middle of a cassette tape album, you have to fast-forward to that spot in the tape, arriving at the proper spot by means of trial-and-error, judging the approximate area by means of a counter that keeps track of tape position, and/or by the amount of time it takes to get there from the beginning of the tape. The access of data from a storage device falls roughly into two categories: random access and sequential access. Random access means that you can quickly and precisely address a specific data location within the device, and non-random simply means that you cannot. A vinyl record platter is an example of a random-access device: to skip to any song, you just position the stylus arm at whatever location on the record that you want (compact audio disks so the same thing, only they do it automatically for you). Cassette tape, on the other hand, is sequential. You have to wait to go past the other songs in sequence before you can access or address the song that you want to skip to.

The process of storing a piece of data to a memory device is called writing, and the process of retrieving data is called reading. Memory devices allowing both reading and writing are equipped with a way to distinguish between the two tasks, so that no mistake is made by the user (writing new information to a device when all you wanted to do is see what was stored there). Some devices do not allow for the writing of new data, and are purchased "pre-written" from the manufacturer. Such is the case for vinyl records and compact audio disks, and this is typically referred to in the digital world as *read-only memory*, or ROM. Cassette audio and video tape, on the other hand, can be re-recorded (re-written) or purchased blank and recorded fresh by the user. This is often called *read- write memory*.

The optimization of searching and retrieval of the system is akin to Search Engine Optimization technique adopted by search engines.

## Work Domains Associated with the Emerging Technology

**Ontology**

It is the subdivision of data science focusing on the nature of user, their behavior and activities on their device. It uses this information to recognize patterns and establishes relationship between various data set and functionality.

**Pattern Recognition**

This domain of data science is a process of differentiating the input data into classes, objects and methods based upon their classification.

Supervised pattern recognition which is a subdivision of pattern recognition is optimally utilized for Face Detection, Face Recognition, Object Detection, Object Classification and Optical Character Reader (OCR).

**Social Media, Blogs and Online Collaborative Environment**

The virtual identity of the user which is a huge domain of social media profiles, blogs and timeline data will be integrated in the system after the user authorizes this data beforehand to be integrated into the system.

**Information Retrieval**

The digital memories now stored over the cloud storage permissible to the device needs to be

retrieved upon being triggered by the minutest search tag or digital search, so the retrieval algorithm needs to handle all the possible tag oriented searched and exceptions should be handled.
To enable a quick Retrieval, the data being stored would be commemorated and linked to the entity it gives connotation about.

**Digital Memory Storage**
The system which is linked with Google Cloud Storage will be used for storing the data and commemorating it with the metadata extracted from the phone's applications and social media network.

**Privacy Sensitive Data Mining (PPDM)**
Data mining and retrieval operation induces security issues and the risk of data leakage. To implement a preventive measure the concept of PPDM comes into picture. PPDM works in order to trim down the privacy risks, unwanted revelation of private data, data publishing and data retrieval.

## Challenges and Limitations

In terms of limitations Google allows only TensorFlow to be deployed on a single machine, granted with multiple GPUs, which can limit the scale businesses, can use the tool. There are naturally workarounds for this, but they require expertise, time and money.
The APIs in TensorFlow 1.0 have changed in ways that are not all backwards compatible. That is, TensorFlow programs that worked on TensorFlow 0.n won't necessarily work on TensorFlow 1.0.
Google has made this API changes to ensure an internally- consistent API, and do not plan to make backwards-breaking changes throughout the 1.N lifecycle.
Storage problem could arise since no cloud provider, even the very best, would claim immunity to service outages. Cloud computing systems are internet based, which means the access is fully dependent on user's Internet connection. And, like any hardware, cloud platforms themselves can fail for any one of a thousand reasons.
Any discussion involving data must address security and privacy, especially when it comes to managing sensitive data. Of course, the cloud service provider is expected to manage and safeguard the underlying hardware infrastructure of a deployment, however remote access is your responsibility and, in any case, no system is perfectly secure.
To varying degrees (depending on the particular service) cloud users have limited control over the function and execution of their hosting infrastructure. Cloud provider EULAs and management policies might impose limits on what customers can do with their deployments. Customers are also limited to the control and management of their applications, data, and services, but not the backend infrastructure. Of course, none of this will normally be a problem, but it should be taken into account.
TensorFlow Commemoration smart devices especially on a small scale and for short term projects – can be pricey. Though it can reduce staff and hardware costs, the overall price tag could end up higher than expected.

## Conclusion

Even with all of the above challenges and limitations of TensorFlow Commemoration smart device, the environment has immense potential for many business models. As platforms mature and the economies of scale continue to grow, costs will continue to fall and reliability and security standards will improve. Continuous vigilant researches are undergoing currently on the TensorFlow technology and it wouldn't be long before the augmented reality is complemented with technologically advance and more accurate TensorFlow .
The impact of such a powerful technology will very soon extend its horizon over smart devices considering Google's excellent manifestation of enabling and empowering each of its smart devices with the latest technological trends and breakthrough's.
Commemoration devices will take this research a level up on the parameters of efficient data storage and faster data retrieval through correlation of data, hence making data management a lot easier and a lot less obfuscated.
An integrated system thus corroborates both of these technological concept and result in smart devices of next generation taking data management to a whole new, complex free, fast space.

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