Artificial Intelligence in the Judicial System

What is Artificial Intelligence?

- John McCarthy, considered to invent this term, described AI as - *allowing a machine to behave in such a way that it would be called intelligent if a human being behaved in a such a way.*
- Intelligence is the ability to reason abstractly, logically and consistently, discover, lay and see through correlations, solve problems, discover rules in seemingly disordered material with existing knowledge, solve new tasks, adapt flexibility to new situations, and learn independently, without the need for direct and complete instruction.
- Thus, in a fundamental sense, AI responds to stimulation in a manner consistent with traditional human responses, given the human capacity for contemplation, judgement, and intention.

Potential of AI

From solving sudoku puzzles to a fully functional human like robot, Artificial Intelligence has grown by leaps and bounds in the past 4-5 decades. Following are the applications and potential of Machine Learning and Deep Learning -

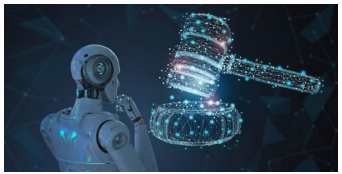
- Classification of Images (IMAGENET started a competition around 2010 to classify images in respective classes. By 2017, accuracies crossed 95% thanks to advancements in Deep Learning)
- Detecting and segmenting objects using computer vision
- Synthesizing Faces that look like real people
- Developing Analogies in Languages in vector spaces (Word2Vec)
- Machine Translation (Eg - Google Translate)
- Image Captioning
- Playing Games (IBM successfully designed ***Deep Blue*** which played and even won a regular chess game against a reigning world champion)

How can AI be helpful in the Judiciary System?

- *Artificial Intelligence* is used in various industries to manage laborious tasks for better speed and accuracy.
- AI can be used the following ways in the Judiciary System -

I. Only a limited proportion of the cases that the judiciary has to deal with, are complex, contradictory cases. If the outcome is predictable, case processing could be partly or even largely automated using AI, precisely because the outcome is largely or entirely certain.

II. In all complex cases, in which the judge or the panel has to give a judgement in order to bring the case to a conclusion, the need for AI mainly consists of knowledge systems that make legal sources easily accessible, and a digital case file that can present large amounts of information in an accessible manner.



1. **Organising Information -** Recognising patterns in text documents and files can be useful, for example when sorting large amounts of cases, or in complex cases that contain a lot of information.
2. **Advise -** AI that is able to advise, can be useful for people and potential parties to a court case, who are looking for a solution to their problem, but do not yet know what they can do. Advisory AI can also be useful for legal professionals. AI can not only look for relevant information, but also provide an answer to a question.
3. **Predictions -** AI that can predict court decisions might be the apogee of AI in judiciary system. Just like the weather, court proceedings risk having an unpredictable outcome. As the case becomes more complex with more information and more issues, that risk increases.

Existing works of AI in the judiciary system

- ★ *Strategic Subject List (S.S.L.)* was introduced in Chicago to predict those individuals who are more likely to be involved in gun violence.
- ★ *Correctional Offender Management Profiling for Alternative Sanctions (COMPAS)* has been used to assess recidivism risk in certain individuals and thus, inform parole and sentencing decisions.
- ★ *Harm Assessment Risk Tool (HART)* used in UK, which uses random forest forecasting has been developed to aid decision-making by custody officers to predict whether suspects are at low, moderate or high risk of committing further crimes within a two-year period.
- ★ *VICTOR*, an AI tool in Brazil is being used to conduct preliminary case analysis to reduce the burden on the court.
- ★ The most extensively described application is one that claims to be able to predict decisions of the European Court of Human Rights (ECHR). This tool uses NLP and ML to predict whether or not in a particular situation the Court will rule whether a particular provision of the European Convention on Human Rights has been violated. This AI claims 79% accuracy.

Humans Vs Compas for recidivism

	HUMANS	COMPAS
Accuracy (overall)	67.0%	65.2%
False positive (black defendants)	37.1%	40.4%
False positive (white defendants)	27.2%	25.4%
False negative (black defendants)	29.2%	30.9%
False negative (white defendants)	40.3%	47.9%

In the Indian Judiciary System

- The first step towards introduction of AI in the Indian Judiciary System was *SUVAS (Supreme Court Vishik Anuvaad Software).* This Tool is especially designed for Judicial Domain and at present, has the capacity and capability of translating English Judicial documents, Orders or Judgments into nine vernacular languages scripts and vice versa.
- *Supreme Court Portal for Assistance in Court's Efficiency (SUPACE)* is a tool that collects relevant facts and laws and makes them available to a judge. It is not designed to take decisions, but only to process facts and to make them available to judges.
- *Indian Legal Document Corpus (ILDC)* for *Court Judgement Prediction and Explanation (CJPE)* - ILDC is a corpus of 35k Indian Supreme Court cases annotated with original court decisions. CJPE aims to predict the final decision given all the facts and arguments of the case and provide an explanation for the predicted decision.

ILDC Data Statistics

Corpus (Avg. tokens)	Number of docs (Accepted Class %)		
	Train	Validation	Test
$ILDC_{multi}$ (3231)	32305 (41.43%)	994 (50%)	1517 (50.23%)
$ILDC_{single}$ (3884)	5082 (38.08%)		
$ILDC_{expert}$ (2894)	56 (51.78%)		

ILDC(single) - This set has documents where there is a single petition or multiple petitions, but the decisions are the same across all those petitions.

ILDC(multi) - It has multiple appeals leading to different decisions.

Limitations of AI in the Judiciary System

- *COMPAS* takes in 137 times of information and comes up with a risk score from 1 to 10. The biggest flaw of it is that it overestimated recidivism among African American defendants compared to Caucasian Americans.
- *VICTOR'S* results might lead to distortion because the AI analyses procedural documents and searches for certain terms that may mistakenly frame resources within the general repercussion. Appellants are also not informed when the tool is used which is in violation of the Brazilian Data Protection Law.
- It was studied that the predictions made by *HART* and by human officers matched only 56.2% of the time, thereby questioning the validity of the tool.
- **Black Box** Problem - With AI driven technologies there are instances where the inputs and outputs are known, but the system by which they are transformed to the other is unknown. This lack of transparency is called the **Black Box** problem. The rationale and mathematical codes of these algorithms are usually kept a secret thereby making it difficult to question the basis of the algorithm.
- AI relies on data and bad data, such as legally incorrect decisions, reduce the quality of the AI result.

Conclusion

- Artificial Intelligence is one of the fastest growing fields in the world today and it’s advent in the field of law could prove to be a boon to the Justice System, if it is used judiciously.
- We are still far from the day where the entire Justice System will be monitored and governed by artificial intelligence. Human intelligence and cognition is still a vital aspect of taking just and unbiased decisions.
- AI cannot replace human judgement (not as of yet) which is necessary for just decision making. Therefore the manner in which AI is efficiently being used in today’s world is primarily in the form of justice systems and augmentation tools. The goal today is to create a system that supplements and not supplant human judgement.

Some informative video links

- Examples of AI already in Legal Firms - https://www.youtube.com/watch?v=7hCZuDnFISE
- SUPACE Portal of Supreme Court - https://www.youtube.com/watch?v=UMJ5ojTOXzM&t=113s
- AI and Law - An Overview and History - https://www.youtube.com/watch?v=BG6YR0xGMRA
- The danger of predictive algorithms in criminal justice - https://www.youtube.com/watch?v=p-82YeUPQh0