TRAINTESTANDSAVEMODEL

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Project	Natural Disasters Intensity Analysis AndClassification UsingArtificial Intelligence

TRAINTESTANDSAVEMODEL:

- In this tutorial, you will learn how to automatically detect natural disasters(earthquakes,floods,wildfires,cyclones/hurricanes)withupto95%accuracyusing Keras, Computer Vision, andDeep Learning.

- I remember the first time I ever experienced a natural disaster — I wasjust a kid in kindergarten, no more than 6-7 years old. We were outside forrecess, playing in the jungle gym, running around like the wild animals thatyoungchildrenare. Rainwas inthe forecast.It wascloudy.

- And very humid. My mother had given me a coat to wear outside, but Iwas hot and uncomfortable — the humidity made the cotton/polyesterblendsticktomyskin.Thecoat,justliketheairaroundme,wassuffocating.

Allofasuddentheskychangedfrom“normalrainclouds”toanominous green:

➢The recess monitor reached into her pocket, grabbed her whistle, and blew it,indicatingitwastimeforustosettleourwild animal antics and come inside forschooling
➢Afterrecesswewouldtypicallysitinacirclearoundtheteacher’sdeskforshow-and-tell.
➢But not this time.

We were immediately rushed into the hallway and were told tocover our heads with our hands — a tornado had just toucheddown near our school.

➢Just the thought of a tornado is enough to scare a kid. But to actually experienceone?That's something elseentirely.
➢The wind picked up dramatically, an angry tempest howling and berating our schoolwith tree branches, rocks, and whatever loose debris was not tied down.

➢It's interesting how experiences as a young kid, especially the ones that scare you,shape you and mold you after you grow up. A few days after the event my mom took metothe local library.
IpickedouteverybookontornadoesandhurricanesthatIcouldfind.EventhoughIonlyhadabasicreadinglevelatthetime,Idevouredthem, studying the picturesintently until I could recreate them in my mind — imagining what it would be like to beinside one of those storms. Later, in graduate school, I experienced the historic 2012derecho that delivered 60+ MPHsustained winds and gusts of over 100 MPH, knockingdown power lines and toppling large trees

➢Thatstormkilled29people,injuredhundredsofothers,andcausedloss ofelectricityand power in parts of the United States east coast for over 6 days, anunprecedented amount of time in the modern-day United States.

Naturaldisasterscannot be prevented — but they can be detected, giving peopleprecioustime to get to safety.

TolearnhowtodetectnaturaldisasterswithKeras,ComputerVision,andDeepLearning, just keepreading!

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Lookingforthesourcecodetothispost?

JUMPRIGHTTOTHEDOWNLOADSSECTION

Detecting Natural Disasters with Keras and Deep Learning In the first part of thistutorial, we'll discuss how computer vision and deep learning algorithms can beusedtoautomaticallydetectnaturaldisastersinimagesandvideostreams.

Fromtherewe'llreviewournaturaldisasterdatasetwhichconsistsoffourclasses:

➤Cyclone/hurricane
➤Earthquake
➤Flood
➤Wildfire

We'llthendesignasetofexperimentsthatwill:
➤Helpusfine-tuneVGG16(pre-trainedonImageNet)onourdataset.

➢Findoptimallearningrates.
➢Trainourmodelandobtain>95%accuracy!Let’sgetstarted!Howcancomputervisionanddeeplearningdetectnaturaldisasters?

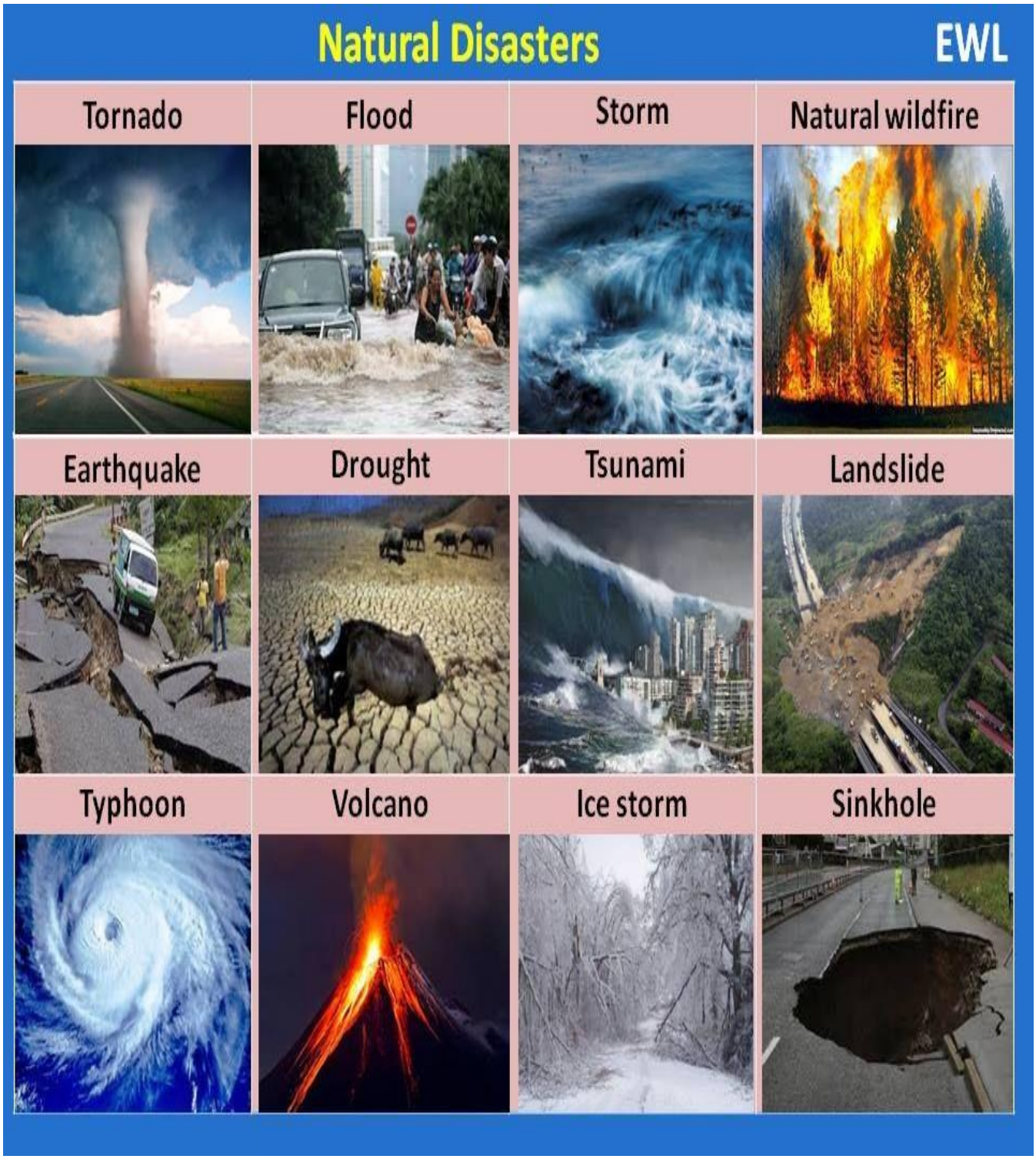

Figure 1: We can detect natural disasters with Keras and Deep Learning using adatasetofnaturaldisasterimages.(imagesource)

Natural disasters cannot be prevented — but they can be detected All around theworldweusesensorstomonitorfornaturaldisasters:

➢Seismic sensors (seismometers) and vibration sensors (seismoscopes) areusedtomonitorearthquakes(anddownstreamtsunamis).

➢Radar maps are used to detect the signature “hook echo” of a tornado (i.e., ahookthatextendsfromtheradarecho).

➢Flood sensors are used to measure moisture levels while water level sensorsmonitortheheightofwateralongariver,stream,etc.

➢Wildfire sensors are still in their infancy but hopefully will be able to detecttraceamountsofsmokeandfire.

Each of these sensors is highly specialized to the task at hand — detect anaturaldisasterearly,alertpeople,andallowthemtogettosafety.

➢Using computer vision we can augment existing sensors, thereby increasingthe accuracy of natural disaster detectors, and most importantly, allow people totakeprecautions,staysafe,andprevent/reducethenumberofdeathsandinjuriesthat happenduetothesedisasters.