Chapter 7
In Action on Desertification:
A Didactic Introduction

ABSTRACT

Human activities, such as over grazing, have turned grasslands in many places into deserts. New methods in cattle management now allows many of these deserts to be returned to grass. Artificial intelligence is now driving a critical moment in the history of technology. Soon sets of Deep Learning chips will appear both in consumer products and in data centers. This quantum leap in technology will result in AIs that are powerful and cheap, but which use only a little power. This breakthrough will strongly affect the ways humans and machines interact. Our young people need to envision some the ways this transition could happen and to get ready. They need to understand what must be done to keep this expanding technology under human control and how to best use it for the good of society. This chapter’s story, “The Matriarch,” looks at an interaction between people, animals, and artificial intelligences.

TOPICS FOR DISCUSSION

The following discussion points come from information covered in this chapter:

1. Can the symbiotic relationship between grass and herd animals be used to reverse desertification?
2. Could an autonomous vehicle driven by an AI team with human beings to do work in the field?

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INTRODUCTION

Can Artificial Intelligences [AIs] really aid in addressing problems caused by climate change?

According to a World Economic Forum report, “Harnessing Artificial Intelligence for the Earth” (AA.VV, 2018), in the last years, there were more than 800 weather and disaster events, triple the number that occurred in 1980. Twenty percent of species currently face extinction, and that number could rise to 50 percent by 2100. AI refers to computer systems that can sense their environment, think, learn, and act in response to what they sense and their learned objectives.

For example, in India, AI has helped farmers get 30 percent higher groundnut yields per hectare by providing information on preparing the land, applying fertilizer, and choosing sowing dates. In Norway, AI helped create a flexible and autonomous electric grid, integrating more renewable energy.

AI for Earth, a Microsoft programme (Microsoft, 2018) has committed $50 million over five years to create and test new applications for AI. Eventually, it will help scale up and commercialize the most promising projects. Columbia University’s Maria Uriarte, a professor of Ecology, Evolution, and Environmental Biology, and Tian Zheng, a statistics professor at the Data Science Institute, received a Microsoft grant to study the effects of Hurricane Maria on the El Yunque National Forest in Puerto Rico. Uriarte and her colleagues want to know how tropical storms, which may worsen with climate change, will affect the distribution of tree species in Puerto Rico.

Another project, named Protection Assistant for Wildlife Security (PAWS) from the University of Southern California (USC, 2018), is using machine learning to predict where poaching may occur in the future. Currently, the algorithm analyzes past ranger patrols and poachers’ behavior from crime data; a Microsoft grant will help train it to incorporate real-time data to enable rangers to improve their patrols.

In Washington State, Long Live the Kings (LLTK, 2018) is trying to restore declining steelhead and salmon populations. With a grant from Microsoft, the organization will improve an ecosystem model that gathers data about salmon and steelhead growth, tracks fish and marine mammal movements, and monitors marine conditions. The model will help improve hatchery,
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