

Foreword

Evolution and Enhancement of Machines

**Power Transmission & Control
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This summer, I toured the foothills of Mt. Asama, an active volcano, with my family. The weather was not very good, and we could only see the fuming peak of Mt. Asama through the occasional break in the clouds. However, we visited the museums and spas that dot the plain at the foot of the mountain and enjoyed the atmosphere of summer resort. My family's favorites were a two-hour walk with a guide called as "interpreter" in the forest and the modern art appreciation in a quiet museum near the forest.

The forest was destroyed by a great eruption about two hundred years ago but grew again after many, many years. A stratum that had been opened up by a rain-induced slide showed a brown layer of pumice, almost 20 cm thick, on top of which plants had been growing and dying repeatedly to form a layer of rich black soil as thick as that of the pumice. The contrast between these two layers points to how a forest that is now home to huge trees has grown.

In the museum of modern art, many of the pieces made me wonder whether they were art at all, given the contrast to the outside scenery that they presented. Difficulty in understanding may be the definition of modern art, and the words of the artists placed between the works were certainly difficult to understand, which made me feel as if I were lost in a forest of philosophy in which abstract existence and deep thoughts were entwined.

Nature and modern art. Accumulation, deep thoughts, and creation. Making these kinds of comparisons may not be appropriate. Our research and development, especially into the area of "machines as tools" that humankind has devised since its emergence, may be compared to these words. Basic analysis is the work to make the soil fertile by creating and storing the nutrients required for the next generation, that is, by gradually figuring out still unknown phenomena related to machines, learning from them and by accumulating knowledge. Fertile land can support large trees with strong roots and make a forest that provides a habitat for a huge range of life forms. In the forest of machines, growing on the land of basic analysis, trees of deep thoughts and creation solve today's problems and bring forth and deliver technologies that will be useful for the next generations.

Accumulation, deep thoughts, and creation. I believe that these ongoing activities lead to evolution and enhancement of machines that is able to coexist with natural forests.