Spatial Grasp as a Model for Space-based Control and Management Systems

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Different countries are now chaotically rushing into space, in a sort of Klondike-like adventures, in hope to provide quick and smart communication, industrial, security, and defense solutions. This often involves massive launches of cheap and unsafe small satellites in low earth orbits, also contributing to the growth of space debris. The talk offers a high-level holistic and distributed system philosophy, model, and technology which can provide analysis and modeling of the current chaotic expansion into space and organize robust space-based systems, starting with their growth from scratch. The author witnessed a similar situation more than a half century ago, being engaged in creation of first citywide heterogeneous computer networks, well before the internet, and is eager now to use this and the subsequent experience for the management of growing celestial systems. The Spatial Grasp Model and Technology described, based on parallel pattern-matching of distributed environments with high-level recursive mobile code, can provide any networking protocols and also any system applications, by properly integrating terrestrial and celestial equipment. The talk contains many examples of technology-based practical solutions, like effective tracing of hypersonic gliders, continuing observation of certain objects and their infrastructures on earth from space, or space-based C2 of large distributed systems, and also collective removal of growing space junk. Different versions of the technology, described in European patent and seven books by Wiley, Springer, Emerald, and Taylor & Francis, were prototyped and used in different countries. Refs: "spatial grasp" in google.com; "sapaty peter" in amazon.com for books.