



FIGURE 1. In a computational nanosatellite pipeline, nanosatellites collect frames along the orbital ground track. Together as an orbital edge computing system, the nanosatellites decompose the frames into tiles and distribute the work of processing tiles across the entire constellation without the need to communicate to Earth. (Modified from [1].)

the tiles when trading bandwidth for image resolution. Second, they show how their edge computing approach can enable them to discard entire tiles because, for example, the tiles are redundant or obscured by cloud cover. Third, they use the classic architectural approach of pipelining to divvy up the tiles among the nanosatellites. All of these approaches, taken together, vastly reduce the demand on precious downlink bandwidth.

Although nanosatellites are not new, their consideration by computer architects is, and it is exciting to think about exploring this vast design space from an architect's perspective. Similar to how mobile computing and data centers drove new processor designs, orbital edge computing could also lead to dramatically new architectures. **□**

REFERENCE

1. B. Denby and B. Lucia, "Orbital edge computing: Machine inference in space," *IEEE Comput. Archit. Lett.*, vol. 18, no. 1, pp. 59–62, 1 Jan.–June 2019. doi: 10.1109/LCA.2019.2907539.

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Digital Object Identifier 10.1109/MC.2020.2983951