

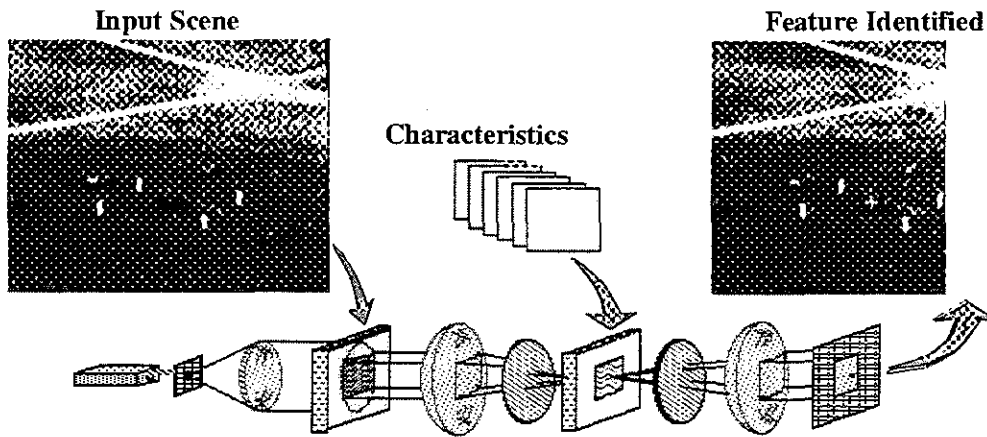
AN INNOVATIVE TECHNOLOGY FOR MARS EXPLORATION

E. Michael Henry
Lockheed Martin Corporation



The human mission to Mars will require innovative technology advances in autonomous control, hazardous avoidance, habitats, environmental protection, and *in situ* resource utilization.

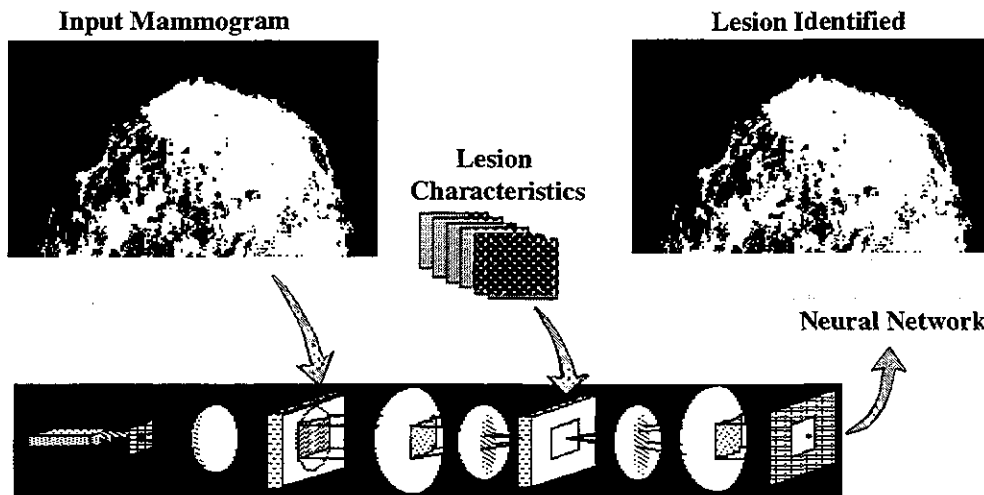
OPTICAL PATTERN RECOGNITION



- **Inherently Massively Parallel (Entire Frame Simultaneously)**
- **Excellent Discrimination, Low False Alarm Rates**
- **Low Power, Light Weight, Small Volume**

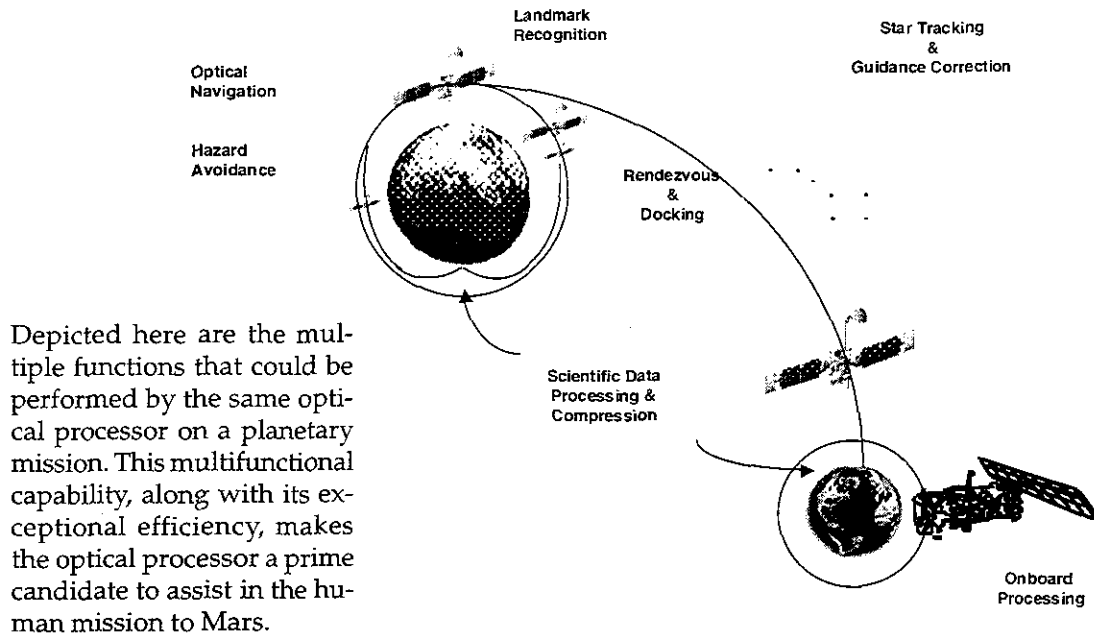
A technology that can perform ultrahigh throughput pattern recognition uses a laser and lenses in a Fourier-transform-based algorithm. It has been shown in DoD applications to have exceptional detection probability and features location accuracy, coupled with the low power/weight/volume essential for a planetary mission.

AUTOMATIC LESION DETECTION



Besides DoD target recognition, the optical processor has been shown to have outstanding capability to detect even tiny cancers in medical imagery.

Application Concepts



Out here there are no stop signs . . . Lockheed Martin believes that no goal in planetary exploration is unachievable.