The Mars Perseverance Rover search for signs of ancient microbial life, which will advance NASA's quest to explore the past habitability of Mars. Moreover, the rover has a drill to collect core samples of Martian rock and soil, then store them in sealed tubes for pickup by a future mission that would ferry them back to Earth for detailed analysis. However, Perseverance also test technologies to help pave the way for future human exploration of Mars.

The vision system which is the Landers Vision system is being added to Mars 2020 to decrease position error down to 40m relative to a map of the landing site. Using this position, the Guidance, Navigation, and Control (GNC) system selects a landing point that is reachable

given the fuel onboard and that also avoids hazards identify/identified a-priori in the map. With this approach, sites that were previously considered too hazardous for landing, but very desirable scientifically, are now viable candidates for Mars 2020 future mission.

Thus, NASA's Mars Perseverance rover acquire image using its Lander Vision System Camera which is mounted on the left side near the front of the rover and looks down at the surface to aid with Terrain-Relative Navigation.

Besides, NASA's Perseverance rover uses the Approximate Clearance Evaluation (ACE) algorithm to evaluate whether the most highly ranked paths are safe. ACE is crucial

for maintaining the safety of the rovers, but is computationaly expensive. If the most promising candidates in the list of paths are all found to be infeasible, ENav must continue to search the list and run time-consuming ACE evaluations until a feasible path is found.

Moreover, the biggest improvement to the landing strategy is that for the first time, the powered descent stage use visual localization to actively navigate to an ideal landing spot, hopefully bringing the rover closer to its target in a safe way.

However, the map is composed of two layers; a high resolution color map covering

the initial exploration area and another true-color Northeast Syrtis regional map. The high-resolution base map was created with images from HiRISE camera on NASA's Mars Reconnaissance Orbiter, while the ~~other~~ broader color base map is from the European Space Agency Mars Express High Resolution Stereo Camera. Some color processing has been applied to both maps to highlight surface features. A high resolution Digital Elevation Model was created from the images to provide critical information for rover drivers, who need to know how steep the hills are as they plan a path forward through this rocky terrain.