

SBIR 06.2 PHASE I - AWARD DETAILS	
ORGANIZATION	MRMC
TOPIC NUMBER	A06-161
CONTRACT NUMBER	
YEAR OF AWARD	
AWARD START DATE	
AWARD COMPLETION DATE	
PROPOSAL NUMBER	A062-161-2894
TITLE	Smart Codec with Telesurgery Capability
PROJECT MANAGER	John Hu (888) 547-4100 jjh@energid.com
COMPANY	Energid Technologies 124 Mount Auburn Street Suite 200 North Cambridge MA 02138 Minority Owned: No Veteran Owned: No Number of Employees: 10
KEYWORDS	telesurgery, robotic surgery, haptic feedback, H264 AVC, Motion JPEG 2000, latency compensation, scalable video codec, adaptive human in the loop codec
ABSTRACT	Energid proposes a telesurgery codec designed for streaming video/images, audio and haptic data with low latency and rapid adaptation to network bandwidth changes. The telesurgery system codec must a) reliably operate over a wide range of bandwidths and network configurations, b) rapidly adapt to abrupt changes in available network bandwidth, c) support haptics teleoperation in a bilateral master-slave telerobotic system, and d) minimize the impact of latency. No codec currently exists that meets all of these needs. Energid will evaluate state-of-the-art codec cores for application to telesurgery. We will add several capabilities to meet telesurgery system requirements. These include low-latency haptic feedback packed into the audio data channels; dynamic adjustment of encoder parameters in response to either network bandwidth changes or human-in-the-loop control from the decoder end; a separate video layer for high-priority adaptive area of interest; adaptive prioritization; and dynamic QoS per data stream. As part of the requirement, Energid will design a scalable video codec (SVC) layer that allows temporal, spatial, and quality scaling in response to network bandwidth changes or user-initiated re-prioritization of a video stream.
BENEFITS	A low latency scalable video and haptics codec that can adjust to rapidly changing bandwidth availability is a crucial enabling technology for telesurgery and remote robotic manipulation. Additional applications include supervisory control for robotic rescue, robotic biologic/chemical agent detection, and interactive applications for 3G mobile devices.