
SUPPORT TO PRIVATE SECTOR TELECOMMUNICATIONS ACTIVITIES:

Cooperative Research with Industry

Outputs

- PC software (VQM) that objectively measures video quality made available on the Internet for evaluation.
- Mobile, broadband measurements of propagation in urban and suburban environments made available to Lucent Bell Labs for research into the performance of Multiple Input Multiple Output (MIMO) antenna systems.

The Federal Technology Transfer Act of 1986 (FTTA), as amended, allows Federal laboratories to enter into cooperative research agreements with private industry, universities, and other interested parties. The law was passed in order to provide laboratories with clear legal authority to enter into these arrangements and thus encourage technology transfer from Federal laboratories to the private sector. Under this Act, a cooperative research and development agreement (CRADA) can be implemented that protects proprietary information, grants patent rights, and provides for user licenses to corporations, while allowing Government expertise and facilities to be applied to interests in the private sector.

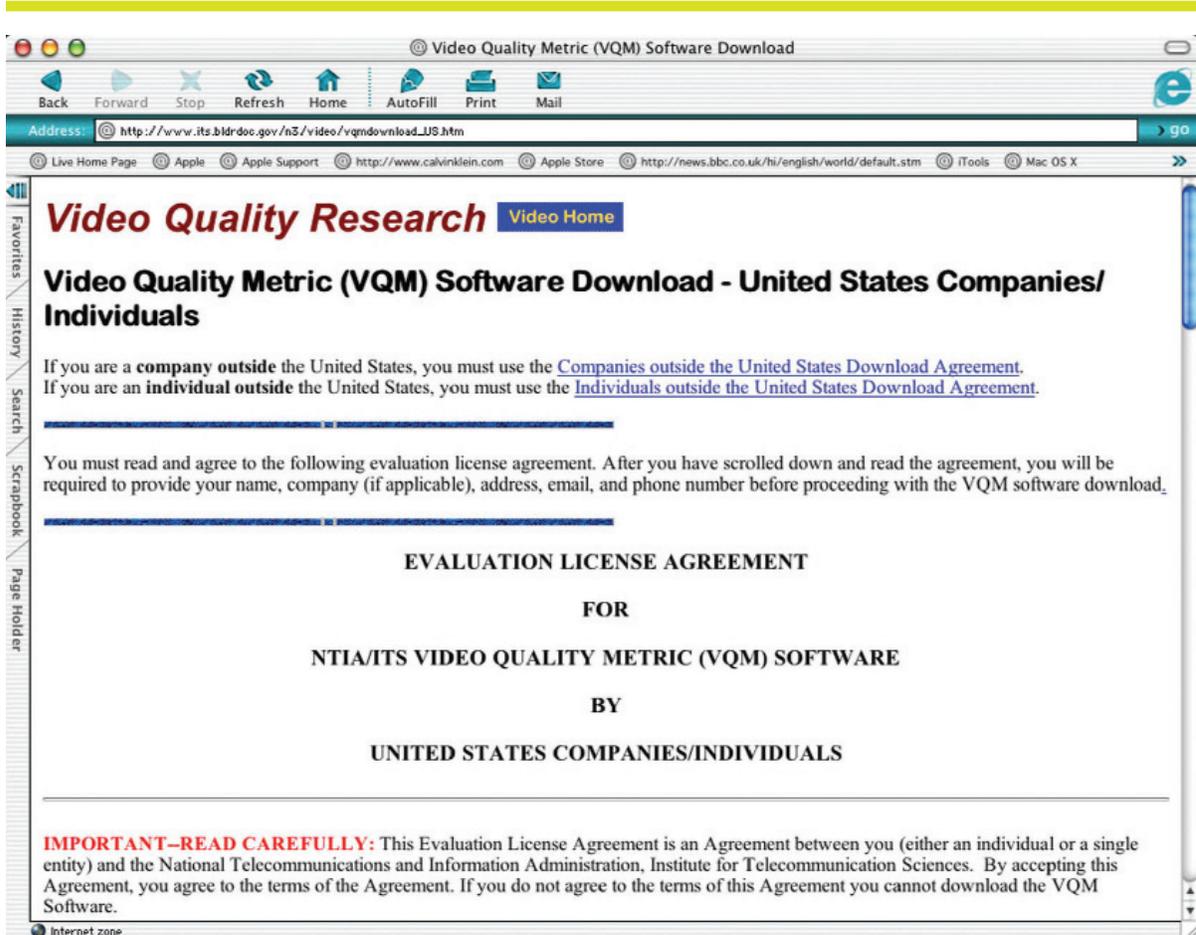
ITS participates in technology transfer and commercialization efforts by fostering cooperative telecommunications research with industry where benefits can directly facilitate U.S. competitiveness and market opportunities. ITS has participated for a number of years in CRADAs with private sector organizations to design, develop, test, and evaluate advanced telecommunication concepts. Research has been conducted under agreements with:

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| • American Automobile Manufacturers Association | • East Carolina University's Brody School of Medicine. |
| • ARINC | • General Electric Company |
| • AudioLogic, Inc. | • GTE Laboratories Inc. |
| • Bell South Enterprises | • Hewlett-Packard Company (HP) |
| • Bell Atlantic Mobile Systems | |

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| • Industrial Technology, Inc. | • Netrix Corporation |
| • Integrator Corporation | • Telesis Technology Laboratories |
| • Intel Corporation | • University of Pennsylvania |
| • Lehman Chambers | • US WEST Advanced Technologies |
| • Lucent Digital Radio | • US WEST New Vector Group |
| • Lucent Technologies | |
| • Motorola Inc. | |

Not only does the private sector partner benefit, but the Institute is able to undertake research in commercially important areas that it would not otherwise be able to do. Recent CRADAs are described below.

- Intel Corporation and ITS have completed cooperative research and development in the area of telecommunications and multimedia. The areas of interest include subjective and objective video quality, subjective and objective audio quality, and wireless communications. PC software that measures the quality of received video signals is available on ITS' web site.
- Lucent Technologies, Bell Laboratories, and ITS initiated cooperative research to evaluate the performance of multiple input multiple output (MIMO) antenna systems for mobile wireless communications. MIMO technology promises to greatly increase spectrum capacity for wireless services including high data rate mobile services.
- ITS entered into 173 new CRADAs, in FY 2003, with parties interested in evaluating ITS' Video Quality Metric (VQM) software (see figure on next page). This software objectively measures video quality as it would be perceived by end-users of a video system. ITS's VQM has been made a national standard by ANSI. VQM is also in the process of being accepted as an international standard by the International Telecommunication Union. The software is covered by ITS patents that are available for licensing under fair and equitable terms.



First page of the online CRADA for Video Quality Metric (VQM) Software, available on the ITS website at http://its.bldrdoc.gov/n3/video/vqmdownload_US.htm

- ITS entered into five new CRADAs with the private sector for the application and evaluation of ITS' Telecommunications Analysis Services (TA Services). TA Services consists of a number of wireless databases and propagation models that can be used on a reimbursable basis.

Cooperative research with private industry has helped ITS accomplish its mission to support industry's productivity and competitiveness by providing insight into industry needs. This has led to adjustments in the focus and direction of other Institute programs to improve their effectiveness and value.

ITS is interested in assisting private industry in all areas of telecommunications. The pages of this technical progress report reveal many technological capabilities that may be of value to various private

sector organizations. Such organizations are encouraged to contact ITS if they believe that ITS may have technology that would be useful to them. Because of the great commercial importance of many new and emerging telecommunication technologies, including third generation wireless (3G), wireless local area networks, digital broadcasting, and intelligent transportation systems, ITS plans to vigorously pursue technology transfer to the private sector through CRADAs and thereby contribute to the rapid commercialization of these new technologies. In addition, ITS plans to commit substantial resources of its own to the development and standardization of these new technologies.

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