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# *Michael A. Ramalho, Ph.D.*

## Objective

Lead Architect or Principal Investigator of networking solutions requiring the joint optimization of transport and media processing technologies.

## Summary

Extensive experience as a director/lead architect/principal investigator of high-talent engineers/students in networking, media signal processing, unified communications and telecommunications. Defined and led research programs and pragmatically developed cutting-edge technical product in both start-up and established company settings. A deft negotiator - has championed designs in politically delicate external organizations. Proven track record for on-time, high-quality, analytically-challenging product designs in both managerial and individual contributor roles. A creative problem-solver and innovator with 24 issued patents, several peer reviewed papers and has been honored with many technical awards in both company and academic settings.

## Experience

**Primary UC Video Architect/ Congestion Control Design/ VoIP failover Algorithms/ G.711.0 Innovation / Voice & Video Quality Initiatives/ IP Transport Scalability/**
*mid-2004 to present*

***Cisco Systems, Wall, NJ/Sarasota, FL/San Jose, CA***

Primary architect for "ordinary" video conferencing rate-control design. Proposed, designed, and built laboratory capability for the assessment of rate-control algorithms. This work required coordination with capacity planning, network design, signaling design, endpoint rate-adaption, endpoint media resilience and Quality of Experience teams spanning multiple BUs as well as transport modeling for congestion-control.

Primary architect and designer for the media monitoring and failover algorithm and code used in Cisco's Intercompany Media Engine. This design "fails over" the best-effort Internet VoIP connection to a QoS-enabled link when insufficient performance is measured. Technology was recognized by being the Pioneer Award "core technology" finalist (Cisco's most-prestigious technical award).

Developed and patented the first-ever application of lossless codec technology specifically for use in VoIP; design eventually resulted in the ITU-T Rec. G.711.0 standard. Brought technology to the ITU-T was moderator of the resulting work item.

Initiator of Cisco's first Voice Quality Summit and Voice Bearer Quality Team; activities resulted in cross-BU, company-wide initiatives. Championed many audio codec and other audio or speech signal processing designs including key conferencing patents.

Initiated Transport Summit for UC scalability, failover and security; work involved large scale Web 2.0 system optimization and cross-BU coordination. Architect for fixed mobile convergence using SOAP/XML with Cisco partners. Was Principal Investigator for networking research work performed at University of Texas at Dallas.

**Engineering Manager/ Seamless Mobility Research/ IP Transport Expert/ Corporate Research/**
*June 1999 to mid-2004*

***Cisco Systems, Wall, NJ/San Jose, CA***

Initiator of Real-Time Seamless IP Mobility research program; was major liaison between key internal teams, external standards and university research (e.g., Stanford). Coordinated prototyping prior to product development. PR-SCTP/RFC 3758 co-author. Many IP mobility concepts later became mainstream IETF standards.

Manager of industry-leading IETF MTS, including a Cisco Distinguished Engineer. Cisco University Research Board member. As a Cisco Research Champion, oversaw and guided university/PI research. Core member of initial SIP Distributed Call Signaling team - the first stateless SIP service provider architecture (later became foundational).

**Internet Telephony Research Initiative Manager/ VoIP Senior Research Scientist**
*February 1997 to May 1999*

***Bellcore/Telcordia Technologies, Red Bank, NJ***

Applied Research Internet Telephony Research Initiative Manager. Managed research and was lead consultant on Internet Telephony performance and quality; presented at many leading scientific research labs. Helped define Bellcore's Softswitch and the first VoIP contol protocol. Developed new Internet Telephony provisioning model (solving a queuing theory issue without closed-form solution). IMTC/VoIP Forum co-chair.

**Chief Telephony Technologist**
*August 1996 to February 1997*

***Voxware, Princeton, NJ***

Lead technology external spokesperson. Was responsible for all network-related technology for speech/audio over IP and assisted bringing the company public in 1996.

**Director of Internet Traffic Impact on PSTN/ Senior Business Development Manager**
*May 1995 to July 1996*

***Bellcore, Red Bank, NJ***
Identified, then championed, the fact that long Internet-related call holding times were causing performance, reliability, and availability problems. Developed a cross-company program that generated over $2M in additional revenue. Work became basis for Bellcore Internet Traffic Engineering Solutions Forum. Formed Network Integrity BU generating over $1M of additional revenue in 8 months.

**Director / Task Force Manager**
*November 1993 to April 1995*

***Bellcore, Red Bank, NJ***
Director of the "Emerging Network Performance Analysis and Characterization" district. Work included the measurement, characterization and simulation of high-speed network performance. Mass Market Broadband Task Force manager with readouts senior telco executives (VPs and CEOs).

**Mid Career Ph.D. in Speech Signal Processing**
*February 1992 to October 1993*

***Rutgers University, CAIP Center, Piscataway, NJ***
Developed a new speech model, The Pitch Mode Modulation Model (dissertation at personal URL above). Applied model to speech enhancement and co-channel speaker/sound separation; model provides ties to speech perception research (e.g., auditory fusion and cochlear modeling). Authored many research grant proposals.

**District Manager**
*July 1986 to January 1992*
***MTS***
*Prior to January 1986*

***Bellcore, Morristown, NJ – Bell Labs (Bell Telephone Laboratories), Whippany, NJ***
Managed 12 MTS to create a Digital Loop Carrier system test bed. Completed 9-month project on schedule and budget. Championed new technical analysis business with non-traditional clients. As MTS co-invented and prototyped new, novel DSL line codes.

## Education

**Ph.D. – Electrical Engineering**
*January 1994*
***Rutgers University*** *- 3.78/4.00 GPA*. Speech Processing, Neural Networks, Communications, Digital Signal Estimation, Numerical and Systems Analysis.

**M. Eng. – Electrical Engineering**
*May 1980*
***Cornell University*** *- 4.00/4.00 GPA*. Course work included highest-tier signal processing, integrated circuit processing and computer/networking architecture.

**B.S. – Electrical Engineering**
*May 1979*
***Rutgers University*** *- 3.93/4.00 GPA.* Broad background in analog and digital circuit design, digital signal processing and microcomputer design.

## Special Skills

Excellent negotiation skills; often tasked to chair forums or tiger teams. Moderator in many standards bodies (ITU-T, ANSI Committee T1, IMTC/VoIP Forum). 24 patents (10+ pending). Wharton Business School Executive Program. MATLAB expert.

## Activities/ Awards/ External Research

Cisco Pioneer Award Finalist. Bellcore Award of Excellence Winner. Bellcore President's Award Winner. Past Rutgers University CAIP Fellow and Industrial Advisory Board member. IEEE Senior Member. ICC/Supercom '92 Technical Program Committee (TPC) Vice-Chair. Globecom '88 TPC member. Red Shift Technical Advisory Board (See: http://www.redshiftcompany.com). Many conference papers (IEEE Communications, ICASSP 2010, IEEE Circuits and Systems, IETF Journal, etc.). Active in university research outreach (Rutgers, Stanford, UT Dallas, USF).

Acquainted with all aspects of research proposals: Authoring (Rutgers), Reviewing (Cisco/Telcordia), Execution/PI (Cisco/Telcordia), and Selling (Telcordia).

## References

***Additional world-class references available upon request.***

***Industry:*** Dr. Mihailo Zilovic (modeling), Dr. Jonathan Rosenberg (SIP co-inventor), Dr. Keith Lantz (video), Dr. James Frauenthal (voice), Dr. Hugh McLaughlin (DSP).

***Academic/Research:*** Dr. James Flanagan, Rutgers (VP Research, prior head of AT&T Bell Labs speech research, USAs President's Award). Dr. James Kaiser (inventor of the Kaiser Window), Dr. John L. H. Hansen (UT Dallas), Dr. T. Russell Hsing (Telcordia)