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BROADBAND & MULTIMEDIA STRATEGY & TECHNOLOGY

Executive leadership in industrial and consumer communications systems/networks: Business development, technology/R&D management, technical and strategic marketing, domestic and international markets. Focus on broadband/multimedia system and networking solutions for content management, distribution, consumption. Specialist in content security and digital rights management as applied in distribution, storage and rendering.

Extensive experience as a technology and business management consultant and testifying expert to the legal community (case listings, references available). Federal District and International Trade Commission experience.

ACCOMPLISHMENTS

- Developed successful consulting business offering a variety of technical, strategic, management, business development, intellectual property and expert witness services.
- Lead security architect to the five major Hollywood studios for specification of security for Digital Cinema.
- Led strategic planning and technical marketing campaign resulting in TV/COM emerging as the first US supplier of end to end digital television compression systems for major operators in Europe.
- Directed numerous large development programs employing leading edge technology, and successfully executed make vs. buy and partnership programs to meet requirements.
- Developed, patented and applied fundamental symmetric-key encryption technology now employed throughout the broadband/broadcast world.

EXPERIENCE

Entropy Management Solutions, President (Current)

Broadband and multimedia consulting services. Specializing in technology strategy and management (identification and development of core technologies, IPR leveraging, positioning, make/buy/partner), business and strategic planning, value creation and market development. Satisfied clients in content security, content delivery networks and systems, intellectual property management, digital rights management, technology management and planning.

- Currently contributing to and consulting for Digital Cinema security standards development: Consultant to "6 Majors" Digital Cinema Initiatives (DCI) studio consortium. Coeditor and continuing contributor to SMPTE digital cinema standards. Former chair of SMPTE DC28 Security and Key Management Ad Hoc.
- Consultant to major SI Valley entity sponsoring the development of an IPR-free DRM solution.
- Security infrastructure planning for theatrical and post-theatrical digital content distributors.
- Security review and enhancement plan for digital high definition hospitality video on demand network.
- Windows Media DRM compliance evaluation for wireless phone Music on Demand service
- Perform set top box evaluations of logical and physical security robustness & copy protection compliance.
- Corporate advisor to supplier of cable audience measurement data (business and technical development).
- Assisted broadband conditional access supplier in evolving security technology into the IP & multicast space.
- IP assertion project manager for European conditional access technology company (8 actions pursued/settled).
- Provided numerous technical expert & consulting services for legal community.
- Numerous technology evaluations for various entities for purposes of market expansion, partnership evaluation.

TV/COM International Inc., Subsidiary of Hyundai Electronics America

Vice President of Product Management 1997-1999

Business management for company's product and system solutions: Competitiveness of product mix, contract compliance, margin definition/maintenance, product marketing, customer support/field service. Cross-functional direction of third party customer relations, contract administration, product life cycle processes, IPR licensing.

General Manager, Conditional Access Business Unit 1995-1997

Business head for the "Control and Conditional Access Systems" group, a P&L unit to develop, market, and support computerized network control and encryption-based broadband security systems for international cable, satellite and wireless/broadcast applications ("AlphaStar Television Network" and German "DF1" BetaCrypt DBS networks).

OCI Communications Inc./ TV/COM International 1990-1995 Vice President and Chief Technical Officer

Defined technical strategies and core technologies, rebuilt technical operations group (50 to 150), established cross functional team organization and formal project management disciplines. Formulated roadmap into digital television, and participated in realizing strategic partnering objectives (Nokia, C-Cube, Fuba, BetaTechnik, Irdeto). Participated in international standards and establishment of European and North American beachhead accounts.

OAK Communications, Inc., Division of OAK Industries, Inc. Senior Vice President, Domestic Operations 1988-1990

Managed US operations for OAK Communications: Technical operations, marketing and sales (revenue capture, account management). As part of three member executive team, executed OCI's divestiture from OAK Industries.

Director Engineering, VP Engineering, VP Tech Ops 1982-1988

Managed engineering, technical marketing and sales, field operations, factory liaison (Taiwan). Developed the industry's first widely deployed consumer systems employing encryption security for satellite, cable and broadcast.

OAK Industries, Inc. 1980-1982 Member, Corporate Advanced Technology Group

Research, simulation and prototyping of technologies in support of OAK's broadcasting businesses. Explored advanced control and digital coding systems for scrambling, compression and transmission of audio and video, and developed/patented the industry's first hard encryption key management and control methodologies for broadcast.

General Dynamics, Electronics Division 1974-1980 Senior Engineer/Project Engineer

Aerospace Engineering: communications, embedded processing, digital signal processing for portable man/aircraft wargame instrumentation, moving target indicator (MTI) digital radar, Global Positioning System receivers.

EDUCATION

Executive Program for Scientists and Engineers	University of California, San Diego	1984
Master of Science, Electrical Engineering	San Diego State University	1979
Bachelor of Science, Electrical Engineering	University of Arizona	1974

OTHER

Publications/Presentations: Numerous technical and marketing presentations, publications and panels in the fields of cable and satellite broadcasting, standards development, broadband, Internet and digital cinema security.

Patents/Applications: "Multilayer Encryption System for the Broadcast of Encrypted Information," U.S. Pat. No. 4,531,020, July 1985. "Universal Decoder," U.S. Pat. No. 5,113,440, May 1992. "Storage & Delivery of Electronic Media with Advertising" US Pat App 10/028,013, and provisional following App 60/38,008, both Dec 2001. "Anonymous Transactions Over a System of Networked Computers" US Pat App 09/654,662. "Remote Audience Participation at Live Events" US Pat App 63/091518, filed October 14, 2020.

Memberships (past/present): Society of Cable & Telecommunications Engineers, Society of Motion Picture and Television Engineers, Advanced Television Systems Committee, Organization for International Standardization, Institute of Electronic & Electrical Engineers.

PERIOD	CASE, FIRM, DESCRIPTION	DELIVERABLES
March 2014 – Aug 2016	COMCAST CABLE COMM, LLC V. SPRINT COMMUNICATIONS CO. L.P.; CIVIL ACTION NO. 12-CV-00859-JD; E.D. PA., LEGAL FIRM: BAKER HOSTETLER, LLP TESTIFYING EXPERT SUPPORTING COMCAST IN PRIOR ART RESEARCH AND NON-INFRINGEMENT ANALYSIS (INTERACTIVE CABLE TV AND	INVALIDITY & NON- INFRINGEMENT REPORTS WRITTEN AND DEFENDED. MSJ FOR NON- INFRINGEMENT GRANTED
Nov 2015 – FEB 2018	MOBILE VOD OVER INTERNET SERVICES) PERSONALIZED MEDIA COMMUNICATIONS, LLC V. APPLE INC., CASE NO. 2:15-cv-1366-JRG-RSP; EASTERN DISTRICT OF TEXAS LEGAL FIRM: KIRKLAND & ELLIS LLP TESTIFYING EXPERT ASSISTING DEFENDANT APPLE IN PRIOR ART RESEARCH AND INVALIDITY (INTERACTIVE TELEVISION SYSTEMS JOHN HARVEY PMC PATENTS)	THREE IPR DECLARATIONS SUBMITTED. INVALIDITY REPORT SUBMITTED AND DEFENDED.
JULY 2016 – JULY 2017	CUSTOMEDIA TECHNOLOGIES, LLC VS. DISH NETWORK, LLC. CIVIL ACTION NO. 2:16-CV-00129, EASTERN DISTRICT OF TEXAS LEGAL FIRM: BAKER BOTTS, LLP	TWO IPR, TWO CBM DECLARATIONS AND EXPERT REPORT SUBMITTED.
	TESTIFYING EXPERT ASSISTING DEFENDANT DISH IN INVALIDITY AND NON-INFRINGEMENT. (DOWNLOADING OF MULTIMEDIA TO A PORTABLE PLAYER WITH DRM).	
SEPT 2016 – JULY 2018	COMCAST CABLE COMMUNICATIONS V. ROVI CORPORATION. INTER PARTES REVIEW OF FOUR ROVI PATENTS. LEGAL FIRM: BANNER & WITCOFF, LTD.	22 IPR DECLARATIONS SUBMITTED, FOUR DEPOSITIONS.
	TESTIFYING EXPERT ASSISTING IPR PETITIONER COMCAST. PREPARED IPR DECLARATIONS (ELECTRONIC PROGRAM GUIDE TECHNOLOGIES).	
FEB – ОСТ 2017	BASCOM GLOBAL INTERNET SERVS., INC. V. AT&T MOBILITY LLC ET AL. CIVIL ACTION NO. 3:14-CV-3942-N (N.D. TEX) LEGAL FIRM: BAKER BOTTS, LLP TECHNICAL EXPERT ASSISTING DEFENDANT AT&T ON INVALIDITY.	DECLARATION IN SUPPORT OF CLAIM CONSTRUCTION WRITTEN AND DEFENDED
	(INTERNET CONTENT FILTERING METHODS.)	
FEB 2019 – DEC 2020	COMCAST CABLE COMMUNICATIONS V. ROVI CORPORATION. INTER PARTES REVIEW OF THREE ROVI PATENTS. LEGAL FIRM: BANNER & WITCOFF, LTD.	NINE IPR DECLARATIONS SUBMITTED AND DEFENDED (3
	TESTIFYING EXPERT ASSISTING PETITIONER COMCAST IN IPRS OF THREE PATENTS. PERFORMED PRIOR ART RESEARCH AND PREPARED IPR DECLARATIONS (ELECTRONIC PROGRAM GUIDE TECHNOLOGIES).	DEPOSITIONS).
FEB 2019 – AUG 2020	DISH NETWORK, LLC V. CONTEMPORARY DISPLAY LLC. INTER PARTES REVIEW OF THREE CONTEMPORARY DISPLAY PATENTS. LEGAL FIRM: KING & SPALDING LLP.	THREE IPR DECLARATIONS SUBMITTED AND

		DEFENDED.
	TESTIFYING EXPERT ASSISTING PETITIONER DISH NETWORK. PERFORMED PRIOR ART RESEARCH AND PREPARED IPR DECLARATIONS (MULTI-INPUT/OUTPUT GRAPHICS ACCELERATOR CARD AND EPG TECHNOLOGIES FOR COMPUTERS AND SET-TOP BOXES).	
SEPT 2019 – DEC 2020	COMCAST CABLE COMMUNICATIONS V. ROVI CORPORATION. INTER PARTES REVIEW OF ROVI PATENTS. LEGAL FIRM: BANNER & WITCOFF, LTD.	SIX IPR DECLARATIONS SUBMITTED AND DEFENDED.
	TESTIFYING EXPERT ASSISTING PETITIONER COMCAST IN IPRS. PERFORMED PRIOR ART RESEARCH IN PREPARATION FOR IPR DECLARATIONS (ELECTRONIC PROGRAM GUIDE TECHNOLOGIES).	
96. FEB 2020 – MAY 2021	RETAINED ON BEHALF OF UNIFIED PATENTS LLC V. TARGETED RADIO LLC IN IPR OF U.S. PATENT NO. 8,948,684. LEGAL FIRM: UNIFIED PATENTS, LLC	IPR DECLARATION SUBMITTED AND DEFENDED.
	TESTIFYING EXPERT: ASSISTED IN PRIOR ART RESEARCH AND DECLARATION AND PETITION. (REAL-TIME CUSTOMIZED ADVERTISEMENT INSERTION INTO STREAMING INTERNET RADIO TRANSMISSIONS.)	
101. OCT 2020 – MARCH 2021	ESW HOLDINGS, INC. V. ROKU, INC. CASE NO. 6:19-CV-00044; WESTERN DISTRICT OF TEXAS. LEGAL FIRM: JACKSON WALKER, LLP	NON-INFRINGEMENT EXPERT REPORT WRITTEN AND DEFENDED.
	TESTIFYING EXPERT ASSISTING DEFENDANT ROKU IN STUDYING NON-INFRINGEMENT. (AUTOMATIC CHARACTER RECOGNITION AS APPLIED TO DIGITAL SIGNATURES/FINGERPRINTS IN MULTIMEDIA FOR CONTROL OF INTERACTIVE TELEVISION APPLICATIONS.)	(NONINFRINGEMENT SJ GRANTED)
103. Nov 2020 – PRESENT	DIVIX, LLC V. JOINT DEFENSE GROUP (SAMSUNG, LG, REALTEC, TCL). ITC INVESTIGATION NO. 337-TA-1222. LEGAL FIRM: FISH & RICHARDSON P.C. & JDG	INVALIDITY REPORT WRITTEN AND DEFENDED.
	CONSULTING SERVICES IN SUPPORT OF JOINT DEFENSE GROUP IN PATENT LITIGATION (MULTIMEDIA CONTENT ENCRYPTION/DECRYPTION BY PARTIAL FRAME ENCRYPTION PROCESSES.)	
104. MAY – JUNE 2020	RE-EMERGENCE OF ABOVE CASE #59: PERSONALIZED MEDIA COMMUNICATIONS, LLC V. APPLE INC., CASE NO. 2:15-CV-1366-JRG-RSP; EASTERN DISTRICT OF TEXAS LEGAL FIRM: KIRKLAND & ELLIS LLP	TESTIFIED AT EDTX TRIAL ON OBVIOUS TYPE DOUBLE PATENTING.
	PTAB APPELLATE BOARD REVISED A CLAIM CONSTRUCTION TERM, RESULTING IN THE INVALIDATION OF ONE CLAIM SET BEING REVERSED. (DECRYPTION PROCESSES OF A DIGITAL SET TOP BOX.)	