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Objectives

Work at the intersection of **innovation** and **development** where the synergy between my curiosity for the novel and my interest in practical solutions can be highly profitable. Contribute **technical expertise** and outstanding **analytical skills** to the design of systems and features that solve actual customer needs. **Engage with customers** to learn about their unaddressed needs, ensure that their requirements are met, **evangelize** solutions, set up and support proof of concept and production deployments. Either work as individual contributor or amplify my impact by leading an engineering or advanced development team.

Qualifications, Qualities, Skills

Superior capability of **leading cross-functional teams** and facilitating interaction with and among people with different backgrounds, expertise, and motivations.

Significant experience in leading development, incubation and innovation projects, identifying avenues to generate revenue from their outcome, and **transfering novel technologies to products**.

Very strong **communication and presentation skills** honed through years of graduate and undergraduate level teaching, as well as socializing technologies and solutions with potential users, partners, and providers of funding.

Proven record in launching and managing complex **research and innovation programs** encompassing multiple interrelated projects involving multiple stakeholders, possibly including Universities.

Exceptional understanding of computer networking. Comprehensive knowledge of a broad range of protocols and technologies: profound understanding of Ethernet, bridging and layer 2 switching, layer 3 routing, routing protocols, network and transport layers of the TCP/IP protocol stack including the various service protocols, MPLS, software defined networks, programmable data plane, network service virtualization, queuing and quality of service. Hands-on experience with networking gear, traffic generators, Unix/Linux protocol stack, P4 data plane programming.

Experienced with a variety of programming and scripting languages. Familiarity with, and understanding of, the challenges in the development of complex software systems as well as corresponding processes. Good understanding of and experience with big data analytics, a number of systems supporting their implementations (e.g., Hadoop), applications to networking and security.

A broad technical background provides the foundation to exceptional expertise in the **architectural design** of computer and networking systems.

Professional Experience

Pensando Systems, Inc., *Technology Director,* Milpitas, CA - 2019-present

Pensando is a startup company developing a platform to support distributed networking, storage, security, and visibility services. The centerpiece of this platform is a PCI card that, installed in servers, enables the distributed execution of services on a P4 programmable pipeline and general purpose processors. Mario covers various roles and responsibilities, as outlined below.

- *Product Management*: ownership of telemetry and visibility services, as well as APIs and Software Development Environments (SDEs) to enable customers to customize the services offered on the Pensando platform.
- *Special Engagements*: support account teams with customers having specific needs that are not covered by the planned commercial offerings. Similarly, work with partners that undertake particularly challenging developments and integrations with the Pensando platform. In both cases, Mario's involvement has the twofold objective of supplying deep technological knowledge, as well as understanding how the various challenges progressively faced along the way can be addressed.

Evangelist: preparation of collateral material, blogging, and presentation of Pensando's solutions at conferences and events.

Academic publishing: identification of scientifically relevant challenges, design and prototypal implementation of a solution based on the Pensando platform, performance evaluation, publication (and possibly presentation) at academic venues.

Standardization: work with the P4 community to create the Portable NIC Architecture (PNA) specification.

University Liaison: launch a university cooperation program to support the development of novel ideas on the Pensando Systems cards and fund joint research projects on topics that are strategic for the company and can lead to significant academic outcomes.

Cisco Systems, Inc., Data Center Switching Group, *Technology Director,* New York, NY - 2016-2019

Part of a team of architects for NXOS, the operating system for data center switches of the Nexus family, Mario's mission was to explore new opportunities offered by a switching platform based on a P4 programmable data plane chip.

daPIPE (DAta Plane Incremental Programming Environment): Mario introduced the concept of incremental programming, explored customer interest, and obtained internal funding to realize a demonstrator of a development environment for incremental programming. daPIPE had been being used in customer field trials that will provide a conclusive assessment of its effectiveness ahead of its productization tentatively slated to start in the first half of 2019. Inventor of a patent application on data plane incremental programming under review by the United States Patent office.

INDeeD (In-Network DeDuplication): motivated by customers indicating the lack deduplication support as one of the shortcomings of the Nexus Data Broker, a packet broker solution based on Nexus switches, Mario has invented an algorithm to perform deduplication in switches with orders of magnitude lower complexity (and cost) than pre-existing solutions. He has implemented the algorithm on P4 to demonstrate the solution and gauge interest within Cisco and among customers. The feature is included as a unique differentiator over competitors in a new profile for 3400 Nexus switches to be released at the end of the calendar year. Co-inventor in a patent application on the algorithm at the basis of in-network deduplication under review by the United States Patent office.

Cisco Systems, Inc., Services Technology Group, *Technology Director,* New York, NY - 2015-2016

Big data platform design and development: contribute to the design and manage the development of a highly scalable, multi-tenant platform for analytics on data at rest intended both for internal use and as a product.

Innovation program: manage and lead research and innovation projects (involving a team of Cisco researchers and partner Universities) from inception, to engagement of sponsor business unit, to selection and engagement of academic partners, to execution, to protection of intellectual property, to technology transfer.

Incubation team: lead a team of engineers tasked with fast software prototyping, development of innovative solutions, implementation and deployment of proof of concept systems and customer pilots. While the main mission is moving completed innovation projects into their next step towards productization, the team also acts as a quick response team of highly skilled developers taking over strategic and time sensitive projects. One notable example is a platform for analytics on data at rest being developed for internal use and as a product.

Architect for a streaming analytics platform; contribute during the early stages of the architecture design.

Co-inventor in 2 patents issued by the United States Patent Office and 3 applications currently under examination.

Symantec Corporation, *Data Scientist Director,* Mountain View, CA - 2015
Lead a team of data scientists and cyber security experts tasked with the design and implementation of a platform for ingestion and correlation of large volumes of data from a wide variety of sources and the development of analytics to identify anomalies, including malware and intrusions.

Narus, Inc. – CTO Office, *Principal Member of Technical Staff,* Sunnyvale, CA - 2012-2014
Narus, a wholly owned subsidiary of The Boeing Company, offers next generation network traffic analysis tools and solutions that focus not only on the network and protocols, but also on end devices, applications and users.

- *Early stage research*: lead a team of researchers and intern PhD students with the mandate to produce novel ideas and assess their impact on the business.
- *Prototype development*: design and lead the execution of prototype systems demonstrating innovative technologies that originate from early stage research. Prototypes are used to assess the interest of perspective customers and potential business partners. Prepare exploitation plans, including presentation material. Evangelization within the company and outside.
- *Technology transfer*: prepare documents describing novel features developed within the CTO Office to be included in products and relevant use cases; interact with Engineering to provide details on the basic principles, design, and implementation of such features.
- *University cooperation program*: manage the whole engagement cycle of teams in US and foreign Universities funded to conduct joint research. This includes defining topics academically meaningful, while relevant to the business, identifying new candidate groups for inclusion in the program, supervising research, and mentoring interns.
- Co-inventor in 6 patent issued by the United States Patent Office and 1 applications currently under examination.

Embrane, Inc., *Principal Architect*, Santa Clara, CA - 2010-2012
Heleos, Embrane's product, was the first distributed software platform for powering elastic network services on demand, specifically tailored for cloud computing.

- *Architecture and design*: provide support to the CTO on architectural and design aspects of the product: improvement of existing features, definition of new ones, documentation of particularly complex product functionalities and internals. On occasions, support Engineering in troubleshooting complex issues. Develop testplans for some of the product features. Participate in design and testplan reviews.
- *Customer engineering*: design, realize and execute product demonstrations; package software, documentation and training material for alpha and beta engagements; provide on-site customer training, installation, and support during field trial.
- *Processes and infrastructure*: contribute to the planning and setup of a test lab; definition and implementation of the issue tracking and release note process.
- Co-inventor in 1 patent issued by the United States Patent Office.

TrustedFlow Systems, Inc., *Co-founder,* Chicago, Il **-** 2000-present
TrustedFlow is a unique technology for the run-time authentication of software in execution on a remote untrusted system.

- Co-invent the technology, protect intellectual property, commercialize the patents.
- Co-inventor in 6 patents issued by the United States Patent Office.

Synchrodyne Networks, Inc., *Vice President for Protocol Architecture,* New York, NY - 1999-2001
Pipeline forwarding, the Company's technology, is a synchronous packet switching and forwarding technique that enables the realization of high-performance, high-efficiency, possibly all-optical, packet switches capable of providing deterministic quality of service.

- Co-invent numerous aspects of the technology, seek intellectual property protection, identify deployment scenarios, design router and switch architectures, conduct performance studies, prepare technical marketing material.

Co-inventor in 11 patents issued in the United States and 1 internationally.

PoliTong – Sino-Italian Campus, *Vice Dean and Operating Project Manager*, Shanghai, China - 2007-2010
The Campus offered B.S. and M.S. programs in Engineering and Industrial Design that led to joint Chinese and Italian degrees.

- *Campus management*: direct academic operations of the Campus; implement and improve teaching programs; select and coordinate Chinese and Italian professors teaching in the program; in charge of admissions and student affairs.
- *International relations*: identify and engage potential partners; design joint and exchange programs, draft and negotiate corresponding agreements.

Politecnico di Torino, *Tenured Associate Professor***,** Turin, Italy, 1997-present (currently on leave)
Politecnico di Torino (Technical University of Turin) is the leading technical university in Italy offering Engineering, Architecture and Industrial Design courses to Italian and international students. Mario Baldi is a tenured Associate Professor of Information Processing Systems at the Department of Control and Computer Engineering.

- *Head of the Computer Networks Group* (2001-2007): set research directions, procure and manage funding, select and hire research assistants, select Master and PhD students, provide leadership and guidance to group members, growing the group from two to ten people.
- *Areas of research and expertise*: internetworking, high performance switching, optical networking, quality of service, multimedia over packet networks, voice over IP, trust in distributed software execution, and computer networks in general.
- *Project coordination and management* of over a dozen research projects involving both academic and industrial partners, funded by European Commission, local government, Italian Ministry or Education, University and Research, various companies and industrial research institutions.
- *Advisor* to about a dozen PhD students and tens of Master students.

Guest Professor at Tongji University, Shanghai, China; Honorary Visiting Professor at La Trobe University, Melbourne, Victoria, Australia; Adjunct Professor at University of Illinois at Chicago; Visiting Professor at Institut de Technologie du Cambodge, Phnom Penh, Cambodia; and **Visiting Researcher** at the IBM T. J. Watson Research Center, Yorktown Heights, NY, at Columbia University, New York, NY, and at the International Computer Science Institute (ICSI), Berkeley, CA.

Education

Ph.D. in Computer and Systems Engineering - Politecnico di Torino, Turin, Italy, 1998.
M.S. in Electronic Engineering with honors (summa cum laude) - Politecnico di Torino, Turin, Italy, 1993.

Patents

31 issued by the United States Patent and Trademark Office
1 issued by the European Patent Office
4 pending applications with the United States Patent and Trademark Office

Publications

Two books, three video courses, and over 150 scholarly papers published in academic journals and presented at international scientific conferences. Full list available at http://pubs.baldi.info