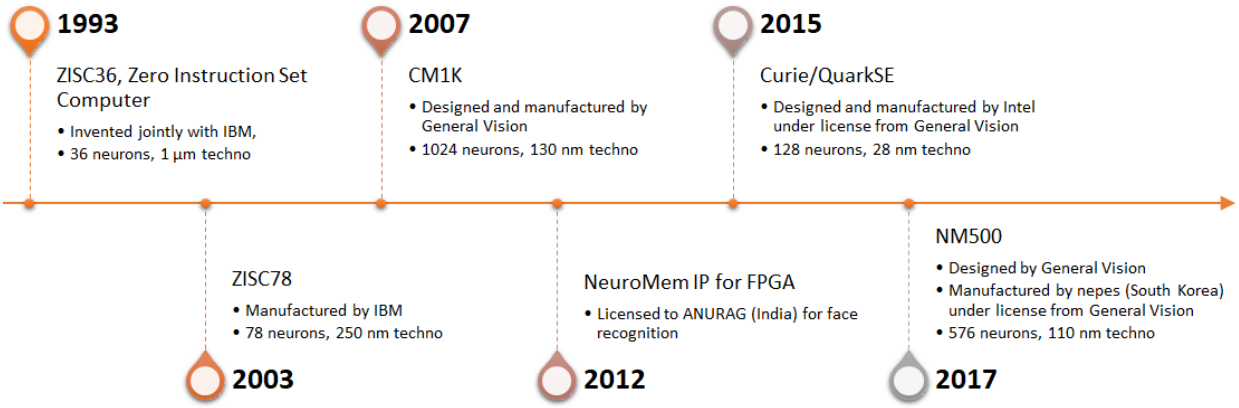
GENERAL VISION

The NeuroMem Odyssey

The NeuroMem® technology has been growing and improving patiently waiting for the market to be ready for its acceptance. Today, the trendy Edge Intelligence and Data Analytics markets are steering the demand for high-speed, low-power pattern learning and recognition.

The NeuroMem technology already has many credentials:

- A technology deployed in five commercial chips (ZISC36, ZISC78, CM1K, QuarkSE, NM500)
- A technology licensed successfully under different forms. Licensees include Intel (USA), nepes (South Korea) and ANURAG (DOD India).
- Existing eco-system: hardware reference design, software tools, documentation, training materials
- Customer credential and success stories in industrial, consumer, and computational applications.



Credentials

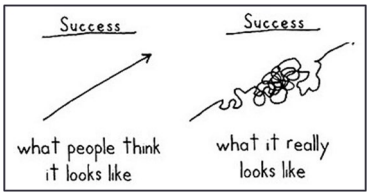
Licensee and Partners

2016 Jan	Sale of a manufacturing license to nepes for the production of the NM500, a NeuroMem Wafer-Level Chip Scale package with 576 neurons.
2016 Sep	Mando-Hella Electronics Corp and General Vision teamed up to develop an advanced monitoring and driver assistance systems integrated with NeuroMem technology. The technology will enable multisensory pattern recognition and image identification.
2014 Jan	Sale of a stacks of 65,000 neurons to Northrop Grumann.
2012 Sep	Sale of three stacks of 40,000 neurons to the Air Force Research Laboratories from CTI for multiple research projects including Size Weight and Power Constrained Applications.
2012 Jan	Sale of a Black box license to ANURAG from General Vision/CTI, Advanced Numerical Research & Analysis Group of the Ministry of Defense of the Indian Government.
2010 Mar	Sale of an IP source license to Intel from Norlitech, non-exclusive, with confidential terms and conditions available upon request under NDA.
2004	Compelling fielded application for off-shore fish inspection from General Vision. The use of the NeuroMem technology has enabled the high-speed and accurate sorting of the fishes with training made by the fishermen off shore. In a confined space such as a fishing vessel, the replacement of 6 human operators doing the same task has increased their profit by $2M per boat per year.

Press Recognition

2018 Jun	General Vision among top 10 of latest Neuromorphic Computing Market Report.
2016 Nov	General Vision is among the top key players in the Artificial Intelligence Market by Technology Survey from Markets and markets.
2016 Jan	Inside NeuroMorphic Computing, interview of Guy Paillet by Semiconductor Engineering.
2015 Oct	MarketsAndMarkets publishes a global forecat and analysis on neuromorphic chips and mentions General Vision is among the top keyplayers in the growing market of neuromorphic chips along with IBM, Intel, Qualcomm, Samsung and others.
2014 Sep	Invitation as a guest speaker to the Darpa workshop on Cortical Processor along with IBM Almaden, AFRL, Northrup Grumman, Stanford University, Georgia Tech, Cornell, etc.
2012	Frost and Sullivan New Product Innovation Award for “Cognitive Computing Processors for Pattern Recognition North America, 2012”.
2007	Conference on Innovative Application in Artificial Intelligence, Recognition of Work for “Fish Inspection System using Parallel Neural Network chip and Image Knowledge Builder”.

Once upon a time…



Timeline of the Technology and Business relations

1993	Guy Paillet presents the concept of a self-trainable parallel neural network chip to IBM and works with a team at the IBM lab in Corbeil-Essonnes, France to produce an ASIC trademarked by IBM as the Zero Instruction Set Computer (ZISC) chip with 36 neurons .
1995-1998	IBM applies for a series of patents used in the design of the ZISC chip. These patents are co-assigned to IBM and Guy Paillet with free rights of use given to both parties.
1998	Silicon Recognition Inc., a Delaware company, is created to distribute and market the ZISC chip worldwide. Guy, chairman, assigns its US patents to Silicon Recognition as initial investment.
1999	Guy Paillet and Anne Menendez join forces and start General Vision by renaming the former company GTFS created by Anne in 1987 and thus merging image processing and neural network expertise under a same umbrella.
2001 Jan	IBM re-spins the chip using a 0.25 micron technology and releases the ZISC78 with 78 neurons.
2001 Dec	IBM closes its foundry at Corbeil (France) and discontinues the manufacturing of the ZISC chip.
2002	Guy Paillet and Anne Menendez start Norlitech, a California LLC to become a IP holding and Guy assigns its non US patents to Norlitech.
2004	Silicon Recognition files bankruptcy and Omnivision (http://www.ovt.com) buys its assets for 1.4 M$ at the Sonoma Bankruptcy Court, including the US patents.
2006-2008	CogniMem Ltd. is established and headquartered in Hong-Kong with Guy Paillet, Anne Menendez, and two angel investors as shareholders. Guy and Anne, as Norlitech LLC, start the design of a new chip to replace the ZISC chip. OKI is contracted to manufacture the CM1K using standard cell technology (130 nm) and the first batch of chips is received in January 2008. During the project OKI Semiconductors was sold to ChipX, then finally to Rohm.
2010	Intel and General Vision enter into a collaboration agreement to prove the concept of the NeuroMem technology across multiple business units with the potential outcome of a license.
2011	Norlitech grants a non-exclusive license the NeuroMem IP to Intel under some terms and conditions which are confidential.
2011	CogniMem Ltd sells the ownership of the CM1K to General Vision and closes its operation. General Vision establishes a subsidiary, CogniMem Technologies Inc., lead by Bruce McCormick, former Director and Manager at Intel, with the intend to market the CM1K chip worldwide. An exclusive agency right is granted by General Vision to CogniMem Technologies. No IP is transferred.
2013	General Vision decides to part from CogniMem Technologies and sells its shares back to the company which keeps the right to sell its inventory of CM1K chips.

	Due to the growing interest in neuromorphic chips, the technology is renamed NeuroMem and the CogniMem trademark is abandoned to CogniMem Technologies.
2014	Creation of NeuroMem Inc., a Californian corporation, with the mission to manufacture, market and sell the CM1K chip and its successors under the lead of Philippe Lambinet. After an 18 months campaign to prepare a professional business plan and visit angel and capital investors, the project is abandoned due to lack of funding. This campaign has brought awareness to the existence of the CM1K chip through several articles, especially in the EETimes.
2015 Jan	Brian Krzanich, CEO of Intel announces the Curie module at the CES with a "Proprietary" Pattern Recognition Accelerator". Upon General Vision's request, Intel corrects the mis-representation of the term "Proprietary" in its publications but declines to publish a corrective statement to the press.
2015 Jun	Expiration of the IBM ZISC-related patents used in the CM1K chip.
2016 Jan	The Curie/QuarkSE module is featured among the key announcements of Intel at the CES with impressive demonstration in the sports and fashion markets
2016 Jun	Maker Collider gets a license to distribute General Vision's CurieNeurons library for the Intel Curie module. Maker Collider produces a series of videos promoting the ease of use of our neurons through the Intel Curie module and its Arduino/Genuino101 boards and using kids from the Shenzhen Open Innovation Laboratory.
2016 Aug	Intel announces a Knowledge Builder utility for the Curie module
	General Vision signs a collaboration agreement with nepes (S. Korea) in preparation of a joint venture to manufacture the new generation of NeuroMem chips.
2016 Sep	General Vision signs a collaboration agreement with Mando Hella (S. Korea) for the development of four projects in the automotive industry.
2017 Jul	Intel discontinues its IOT business and consequently the Curie module, but keeps manufacturing the QuarkSE with its Pattern Recognition Engine.
2017 Jan	General Vision grants a license to nepes (S. Korea) for the manufacturing of a Wafer-Level CSP NeuroMem chip with 576 neurons. The licensed product is a GDSII file produced by GV through UnoSilicon.
2018 Jan	Release by nepes of the production samples of the NM500 along with the NeuroShield and NeuroBrick evaluation modules.