

Statement of purpose



Statement of Purpose My name is Carlos Nieva. I received the degree of Bachelor of Science in Electronics and Telecommunications in the fall of 1998 from ITESM (Instituto Tecnológico y de Estudios Superiores de Monterrey), Mexico. I received the degree of Master of Science in Electrical Engineering in the fall of 2002 from NMSU (New Mexico State University). My advisor and co-advisor during my Master's degree studies were Dr. Jaime Ramírez-Angulo and Dr. Paul Furth, respectively. The topic of my Master's degree thesis is " Low-voltage, class AB and high slew rate two-stage operational amplifiers". The curricular focus of my bachelor degree is in electronics and communications. During my undergraduate studies I took several courses covering topics in electronic design, analog and digital communications and microwave devices such as transmission lines and antennas. The curricular focus of my Master's degree was strongly based in analog circuit design using CMOS technology. My circuit designs were implemented with a point fivemicrometer CMOS technology. My thesis proposes a new op-amp architecture that operates at very low voltages and offer higher speed performance compared to classical op-amp architectures. The thesis project includes the circuit design, spice simulations, the chip layout design and the chip testing at the laboratory. The chip layout design was sent to the MOSIS service for fabrication. During my Master's degree I took courses in CMOS analog, digital, RF and mixed signal design. Other complementary courses taken for the completion of the degree were in the areas of microwave engineering, DSP and communication systems. The areas of research that I am interested in are classified into one of the following categories. One area of interest is the circuit implementation of data wireless communication systems and DSP systems. The second area of interest is the development of

circuits for RF and high-speed mixed signal applications. Some examples for this area of interest are RF front ends, mixers, PLL, frequency synthesizers, VCO, filters and data converters. A third area of interest is the development of circuits for microwave applications such as radar, remote sensing and satellite broadcasting. The research experience I obtained during my Master's degree studies helped me develop the skills I consider very useful to perform research. I was able to clearly understand the basic concepts behind the circuit designs, summarize information from related bibliography and compare existing designs to the design proposed in my thesis. After finishing the research for my Master's degree, I feel that I have the necessary tools to start a research project that will lead to an original contribution in the area of Electrical Engineering. I know that to channel my research efforts I need to find the correct PhD program with the most successful and experienced faculty to guide me through this journey. During my Master's degree studies at NMSU, I was a teaching assistant throughout all my studies. The courses that I taught were Basic Electrical Networks laboratory, Introduction to VLSI laboratory and Digital VLSI design laboratory. In those two years of teaching courses for undergraduate students I realized that it gave me a lot of satisfaction seeing my students learn from my lectures. I tried to focus my lectures on concepts that I, from my personal experience as an undergraduate student, consider hard for the student to understand. So after giving my lecture, I felt satisfied knowing that my students had understood such concepts faster and through a lesser effort than is normally required. After completing my Master's degree studies I am convinced that teaching and research is what I enjoy the most and that it is the activity I would like to dedicate the rest of my life. Now I am looking for a

PhD degree program that will help me to further develop my experience in research and teaching. After completing my PhD degree in Electrical Engineering my plans are to obtain a Professor's position at a recognized University, to build a research program with close ties to industry, and to teach classes related to my research field. Fortunately I have two years of experience working for industry and I think I may employ that experience to offer my students an insight of what is happening outside Academia. Furthermore, my relationship with industry will continue to develop through my PhD studies because I was awarded with a GEM fellowship (National Consortium for Graduate Degrees for Minorities in Engineering and Science, Inc), which is an organization that in combination with an industry sponsor will support my graduate studies and will offer me summer internships with the sponsor. In my case the industry sponsor is Intel Corporation. With this opportunity in hand, I will be able to increase my industrial experience and at the same time establish important industry relations that will help me later, as a College Professor, to find funds for my research.