

Doctor Mentoring in Quantum Computing, Case Studies in Artificial Intelligence, Java Programming, Management CEE Countries

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Abstract

Harvard Business School, and other MBA and Executive MBA programs created Case Studies for their students. Using Case Studies for Undergraduate and Master programs provided good outcome. For PhD candidates, they do quantitative or qualitative research for real world Case Studies. But there were few Case Studies in the literature for Artificial Intelligence, Java Programming and Management CEE Countries.

At Dominican University, Management CEE Countries was offered for onsite Undergraduates. Artificial Intelligence was offered to Master students, at Pace University. Java Programming was offered at New Jersey Institute Technology, Master students. This author is mentoring Doctoral students in Quantum Computing at Capitol Technology University online.

Doing Case Studies in these courses, online or onsite, with Undergraduates, Masters, PhDs, provided a sound foundation for critical thinking, and team building skills. Student reviews were good to excellent. This paper gives a summary.

Keyword: Artificial Intelligence, Java Programming, Management CEE Countries, PhD Mentoring Quantum Computing, and Real-World Case Studies

(A) Dominican University*

Dominican University is located 14 miles northwest of New York City. This author joined Dominican University in 1988 as an Associate Professor in the Business Division. In Spring Semester of 2024, the University enrolled 2000+ students. The Business Division offers Bachelor of Science programs in Finance (FI), Marketing (MK), Information Technology (IX), International Management (IM), and Sports Management (SM). Master's Degree Business Administration

(MBA) was approved by the State of New York in 2008. This author served as the Director of Business Administration Division from 1990 to 1996, and taught courses in IX, MK and IM curriculum.

MG 223 Management CEE Countries

This course provides in-depth analysis of the management issues in Central Eastern European (CEE) countries: Czech Republic, Hungary, Poland, Slovakia and 19 others, Owarish and Hsu (2018).

Topics are culture, political, economic aspects, foreign direct investments, technology transfer, production, manufacturing, operation, import and exports. It aims to be the follow-up course of MG 221 Emerging Market Management, a three-credit course, covering Brazil, Russia, India and China management issues, taught in Spring 2022, Hsu (2016).

Objectives:

- describe the Management issues of CEE countries and beyond
- understand the importance of business models
- examine the culture, political and economic aspects
- explain the foreign direct investment
- introduce manufacturing and production
- comprehend supply chain management
- learn the global merger and acquisition
- discuss technology transfer
- define import, export, and logistics
- provide a socially responsible global society
- perform in-class labs

7 people enrolled in Spring Semester 2024. They were International Management majors, except one in Finance, one in Management.

The textbook was difficult to find. After much effort, Goncalves and Smith (2016) was adopted. This book got six chapters, but it did have plenty of data tables showing the economic progress of CEE countries. It was used for about five weeks of the semester.

Each lecture used internet search via Bing.com, and copilot ChatGPT for the details of Czech, Hungary, Poland, Slovakia, and then covered some of the other CEE countries. In-class exercises included: Czech Case, Slovakia Case, Poland Case, and Slovenia Case Study.

This was done in class for one class period. Students performed two of them for each country. Students did eight in-class team exercises for the semester. Using E-Leader papers published by Chinese American Scholars Association, they gained practical knowledge on the management style and business operation of CEE countries. Most of them never visited or heard of these countries. “Hands-on” team, provided a wonderful way to learn.

For the lecture class, using internet, books, YouTube, and ask questions:

Name the top five automakers, banks, asset management firms, retailers, and oil companies in the world. Name the four most populated countries in the world. How many people are in the European Union? What is CEE? What is the emerging market? Is selling products in USA the same as selling in CEE? Name the major manufacturing or service companies in CEE region. How many countries are CEE made of? What is the benchmark or role model after they became independent countries in the 90s? Can you make money starting an import/export company today with CEE? If yes, how? How would the Ukraine Russia war impact on CEE countries? Why does American have such a huge military budget? What is FDI? Why will multinational companies invest in CEE? Why is the exchange rate important in CEE? With oil prices going higher, how would this affect international deals? This type of question keeps the lecture alive. Students are challenged to find answers.

For the final projects, they did extensive research on the company core business, sales, profit, financials, SWOT analysis, competitors, future plan, in Croatia, Czech Republic, Hungary, Kosovo, Poland, Slovakia, Slovenia, see Table 1.

(B) New Jersey Institute Technology**

The New Jersey Institute of Technology (NJIT) is a public research university in the University Heights neighborhood of Newark, New Jersey. As of Spring Semester 2024, the university enrolls 12,300+ students, over 2,500 of whom live on campus. NJIT offers degree programs including 51 undergraduate majors and 71 graduate (Masters and PhD) programs.

CS 602 Java Programming

In Spring Semester 2024, this author taught Java at NJIT, as an adjunct professor. This course is for students pursuing a Master Degree of Computer Science.

Deitel and Deitel (2018) wrote the textbook. Students learn how to create and deploy Java Programming. Topics covered: AWT, Inheritance, Java Programming, OOP, Files Streams, Swing, Data Structures and JDBC. Hands-on exercises and programming projects were required.

This author taught Java Programming for 22 years, Hsu (2002). Covering the entire book 25 chapters in one semester was still a challenge. Students did Eclipse free download. Then they would create, compile, run and explain the codes.

There were 78 people enrolled, most of them came from India, only 1 American. Students formed 15 teams of five or six people in each. Each team had a project manager. Three homework assignments were graded. Each homework assignment got six individual questions and four team questions. The team questions were difficult for individuals. Working in a team helps the weaker students. Due to the large class size, the classroom was in CKB 204, with 90 seats, 4 big computer monitors, crystal clear visibility. Reading the PowerPoint slides for each chapter, ask students one by one, takes a long time. But it was worth it. By getting their answers, their level of understanding is evident. It turned out, the Indian students were in Engineering, Computer Science, but with no

knowledge of accounting, management, marketing, and other business operations. As a result, many real-world successes in business were given in class. Asking them if they wished to stay in USA or going back to India, after they get the master's degree. Most of them opt to stay in the USA. Ask them to create a free LinkedIn profile, as a starting point, LinkedIn (2024). Many of them did.

Final Exam was a team project with PowerPoint presentation. The Case Study used the example in the textbook. Each team wrote a paper and provided PowerPoint (PPT) slides. Each person presented three PPT slides. Final projects were: Binary Tree, Circular Buffer, Color Chooser, Draw Stars, Fractal, Merge Sort, Poly Shapes, 3D Java FX, and XML Serialization. The presentation was done in two classes, 8 teams on 4/27/2024, 7 teams on 5/04/2024. They did excellent jobs. The class evaluations are good to excellent.

Now they are ready to work as Java Developers. Java is in high demand with major tech firms: Amazon, Facebook, Goldman Sachs, Google, IBM, Microsoft, Oracle, and Verizon, just to name 8. The salary ranged from \$85,000 to \$200,000 per year.

(C) Pace University**

Pace University is a private university with three campuses in New York: Pace University in New York City, Pace University in Pleasantville, and Pace Law in White Plains. It was established in 1906 as a business school. Pace enrolls about 13,000 students in bachelor's, master's and doctoral programs.

Pace University offers about 100 majors at its six colleges and schools, including the College of Health Professions, the Dyson College of Arts and Sciences, Elisabeth Haub School of Law, Lubin School of Business, School of Education, and Seidenberg School of Computer Science and Information Systems

CS 627/CS 385 Artificial Intelligence

CS 627 is offered for the 29 students in Computer Science, Master program. CS 385 is for 9 students in Computer Science, Undergraduate program. It is a four-credit course. All 38 students attended the same class in person, Monday evening, at One Place Plaza, New York City, Spring 2024.

Course Description: Theory, data structures, algorithms related to artificial intelligence (AI) and machine learning. Topics include cognitive processes, heuristic vs. algorithmic methods, state space and problem reduction, search methods, theorem proving, natural language processing, pattern recognition, machine learning, neural network, AI applications in real world situations.

Learning Outcomes for CS 627/CS 385, Artificial Intelligence:

- Use heuristic programming to solve problems
- Design intelligent agents using a variety of search algorithms

- Learn the techniques used in machine learning
- Explain neural networks and decision trees
- Understand the methods used in computer games
- Translation as encoding and decoding
- Define computer vision and language translation
- AI applications and jobs in real world

Master students came from India, undergraduates were Americans. This author taught courses for 35+ years but did not teach both in the same course. It turned out the Indian students with work experiences from India, did better work in general. During classroom discussion, India students performed better too.

The selection of textbook was challenging. AI has been around since 1957. With so many books, papers, videos, films, the public information is overwhelming. This author emailed several computer science chairs and colleagues. It seems that everyone is using Russell and Norvig (2020). But this book was just too much math, not enough AI real world applications. This author did research, found out many of AI doctoral thesis were pages of pages of mathematical formulas, calculus, etc. There were no real-world applications. After extensive research, Mitchell (2020) was chosen as the textbook. On Amazon, this book got 490 positive reviews.

OpenAI released ChatGPT on November 30, 2022. With Microsoft billions of investments, OpenAI has a \$86 billion valuation, in AI, Cloud Computing and related business. Amazon, Apple, IBM, Facebook, Google, Microsoft, embracing AI. Why? It is the buzzword for marketing their product and services.

Every week, students attended in person class, asked/answered questions actively. There was a weekly post from the chapter every week. 38 people were set up with 4 or 5 in each team. Each team was assigned a manager. Three homework assignments were graded. For the 10 questions homework, 5 were team and 5 were individual. They worked with their team members and manager to submit answers for team questions. This strategy worked out well.

Final project consists of papers and PowerPoint presentations: (1) Surgical Robot, (2) Facial Recognition, (3) Game AI, (4) Python AI, (5) Driverless Car, and (6) Metaverse, (7) Scale AI, (8) Quantum Computing. The final paper grade is the same for the team. But PowerPoint presentation grade is individual. They did great work. Many were eager to apply jobs in AI, NYC. Students enjoy the learning very much.

(D) Capitol Technology University**

Capitol Technology University is a private university in South Laurel, Maryland near Washington, DC. The university was founded in 1927 as the Capitol Radio Engineering Institute by a former US Navy Radioman. CREI changed its name to Capitol Institute of Technology in 1964, changed its name again to Capitol College in 1987, and assumed its present name in 2014.

Capitol offers undergraduate and graduate programs specializing in engineering, computer science, information technology, and business. It is classified among "Special Focus Institutions—Schools of Engineering" and is a National Center of Academic Excellence in Information Assurance Education.

Capitol Technology University, through its Department of Computer Science, provides degree programs in the concentration areas of Computer Science, Artificial Intelligence and Data Science, at each of the bachelors, masters, and doctoral levels of study.

Capitol currently offers thirty-eight doctoral programs. For Quantum Computing, it is a research-based doctorate PhD degree where student will be assigned an academic supervisor to guide through the program and is based on mostly independent study through the entire program. It typically takes a minimum of two years but typically three years to complete if a student works closely with their assigned academic advisor. Under the guidance of academic supervisor, student will conduct unique research in the chosen field before submitting a thesis or being published in three academic journals agreed to by the academic supervisor.

This author started mentoring doctoral students at College of Doctoral Studies (2023), University of Phoenix, since July 2016. 20 people obtained their doctoral degrees in Business Administration, Education Leadership, Management Organization Leadership, Information Systems Technology, Healthcare Administration, and Industrial Psychology, Hsu (2020), Hsu (2023). Through connections from LinkedIn (2024), in January 2021, this author learned about the Capitol doctoral program, and was hired as a doctoral mentor/academic supervisor.

There are three semesters in a year. The first one starts January 1 through April 30, second one May 1 through August 31, third one September 1 through December 31. Each semester is about 4 months, or 16 weeks. Ten courses are required for the doctoral degree. So, it is possible to complete it in three years and four months or sooner, if the student takes two courses in any given semester.

Using code to protect student privacy, JS for John Smith. MM needed a mentor on technical content and mathematics. He signed up to be the first doctoral student in May 2021. His topic is Cyber Security. We spend one hour in Zoom (2024), every week, Monday 2 to 3 pm. We discussed his research questions, technical content, and his approach to solving the problems. After three to six courses, he developed his own IoT model, using Java programming codes. He passed both the ARB and IRB requirement from Capitol, Hsu (2023). In July 2023, MM passed his oral defense and received the Doctoral degree in Cyber Security. In August 2023, MM got a full-time position as a Professor in a University very close to where he lived. It makes this author very proud of his achievement.

In January 2022, three students came on board. BR is doing Artificial Intelligence (AI), KN is also doing AI. VH is doing Quantum Computing (QC), After several courses, VH passed both ARB and IRB. KN just passed his ARB.

In April 2024, VH passed Oral Defense and received her Doctoral Degree in Quantum Computing. Her research work was to employ IBM SPSS for data analysis of 100+ research

papers in QC. Again, this author is very proud of her doctoral work.

In September 2022, 2 joined the group. AH is studying AI, MN is doing Space Cybersecurity (SC). I am not an expert in this field. But in a short two months, MN was able to find 30+ papers on SC, very interesting development. For each semester, the doctoral faculty can mentor a maximum of 10 students. I could not do more. I asked Capitol to reassign MN for a different mentor.

In January 2023, three people were on board. MW is doing AI, DF doing QC, SF is also doing QC. I met the students (AI and QC) weekly in the Zoom, for one hour. Due to the popularity of ChatGPT, there is paper, video, books, on AI almost every day, if not every hour. QC is gaining popularity due to IBM, MIT, and global competition for faster computer research and development.

In May 2023, two more joined. EC is doing QC, and JL is going AI. Some students did not attend every semester, due to personal or financial reasons.

As of this writing, this author is mentoring 10 students, 5 in Artificial Intelligence and 5 in Quantum Computing. 6 students already got the ARB approved; they are writing their thesis now. As a Chair, this author benefits much from working and learning from their paper submissions and their weekly feedback. It has been a very rewarding experience.

Many students and graduates appreciated what this author did, provided positive feedback on LinkedIn, Table 2.

Conclusion

Students/professionals learn the theory and need to connect it to the real world. 123 people completed Artificial Intelligence, Java Programming, Management CEE Countries, at three Universities. 10 candidates are pursuing their doctoral degrees in Artificial Intelligence and Quantum Computing. Teaching and learning strategies included in-class use of Business Week, CNBC, Financial Times, Forbes, Fortune, Internet Search, and YouTube. Final projects involved a written paper for a specific Case Study and the PowerPoint presentation by a team or an individual. These tools and reports contributed to the success in an E-Learning environment. Students/professionals raved about the experiences.

Acknowledgment

Prof. Ivan Rudolph-Shabinsky at Dominican University; Dr. Vincent Oria at New Jersey Institute Technology, Dr. Lixin Tao at Pace University and Dr; Ian McAndrew of Capitol Technology University, provided their guidance and support.

*Full-Time Position **Part-Time Consultant

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Table 1	MG 223 Management CEE Countries	5/06/2024	
<u>Group A</u>	<u>Topic</u>	<u>Group B</u>	<u>Topic</u>
Guevara	Radovan Vitek	Davis	Diminika Kulczyk
	CPI, Czech Rep		Kulczyk, Poland
<u>Group C</u>	<u>Topic</u>	<u>Group D</u>	<u>Topic</u>
White	Sandor Csanyi	Brown	Ivan Chrenko
	OTP Bank, Hungary		HB Reavis, Slovakia
<u>Group E</u>	<u>Topic</u>	<u>Group F</u>	<u>Topic</u>
Nikollaj	Behgjet Pacolli	Legg-	Samo Login
	Mabetex, Kosovo	Washington	Outfit7, Slovenia
<u>Group G</u>	<u>Topic</u>		
Perez	Ivica Todoric		
	Agrokor, Croatia		

Table 2 Public Recommendation on LinkedIn

Nadia Mtchedlidze, Source to Pay Senior Specialist @ Henke, June 11, 2024, I had the privilege to meet Dr. Donald Hsu at the E-Leader Conference in Bratislava, held from June 3-5, 2024. Dr. Hsu's exemplary leadership, meticulous attention to each participant, and motivating guidance for our future career goals deeply impressed me. His extensive experience and commitment to fostering an inclusive and collaborative environment significantly enhanced the conference, making it a truly enriching experience for me. I am confident that future E-Leader conferences will continue to thrive under his stewardship. Thank you, Dr. Hsu, for your dedication and inspiration!

<p>Illia Kramar, CEO of Arkway.me, June 1, 2024, Professor Donald Hsu's Sales Management course was highly insightful and engaging. His expertise and practical approach significantly enhanced my sales skills.</p>
<p>Marina Apostol, Local Service Specialist, May 7, 2024, I really enjoyed the course called Sales Management taught by Professor Hsu. Useful information, real business cases and open communication with the students during the lectures. Thank you, Professor!</p>
<p>Josephine Chan, Passionate about delivering efficient and efficacy application developments to enhance the customer satisfaction, May 3, 2024, I had the opportunity to attend Dr. Hsu's CS 312 Research Method online course with 20 others at Pace in Fall 2022. I was a manager for a team of 4 people and did a final project on Survey Monkey. Dr. Hsu improved our learning experience by relating the course objectives to real-world problems and the tech industry. He was a supportive professor who's encouraged us to think outside the box. He's taught us how to understand the industry and customers in our field. I was able to utilize what I learned in my career. He has increased my ability to understand our customers' needs as well as viewing our software from the perspective of our customers.</p>
<p>Pavel Guzanov, SAP Consultant/Business Architecture Analyst, April 8, 2024, I had a great opportunity to attend "Channel distribution" course led by Mr. Hsu. It was an absolute please and a fabulous experience to gain knowledge and some inside tips from his rich multi-year experience.</p>
<p>Alex DiMenna, LNHA CALA Ed.S. Executive Health Consultant & Educator, March 17, 2024, Dr. Hsu has been an exceptional connection and mentor who has lived the Dominican University value of "More than an Education, a Relationship". Dr. Hsu has maintained contact over the years, consistently checking on my education goals and the progression of my career. I have also had the opportunity to guest lecture for his courses in the past and teach alongside him. Dr. Hsu has always offered an encouraging word and assistance on career progression and development. I have enjoyed working alongside Dr. Hsu and continuing our professional education relationship. Dr. Hsu is well versed in international business and keeps current on the changing dynamics of the field. This includes a focus on Artificial Intelligence as it relates to international business, computing and economic impact.</p>
<p>Matthew Contrabasso, Multi-disciplined Recent University Graduate Future Artificial Intelligence Engineer Committed to Continuous Learning and Innovation, February 14, 2024, I took Dr. Donald Hsu's CS- 312 class, Research Methods, at Pace University. I highly recommend it to anyone who is interested in learning about various research methods and ethics. Dr. Hsu is very informative, engaging, and can make complex concepts understandable for all of his students. He can use real-world examples which provided practical insights into the application of various research methodologies. Dr. Hsu can merge his casual and passionate demeanor with a professional setting which works well. Dr. Hsu always is approachable and happy to offer advice whenever any student asks. By connecting with students on a personal level, Dr. Hsu can keep students participating in class by linking their interests with lessons. As I pursue Data Mining and Machine Learning post-class, Dr. Hsu's lessons both about Research Methods and about life in general have been a great help!</p>
<p>HimaSundhar Raju Meesala, Actively Seeking New Opportunities M.S. in Computer Science at NJIT Former Associate Software Engineer at Tech Mahindra, January 24, 2024, I had the privilege of being a student under Professor Hsu Donald's guidance, and I wholeheartedly recommend him for his exceptional support in acquiring comprehensive knowledge of Java.</p>

Professor Donald's extensive experience in the field, coupled with his dedication to teaching, significantly enriched my understanding of Java programming. His guidance not only elevated my academic coursework but also provided valuable insights into the professional applications of Java. Professor Donald's vast network and career guidance were instrumental in shaping my approach to Java-based projects, and I am truly grateful for the impactful mentorship he provided. I highly recommend Professor Hsu Donald to anyone seeking an expert mentor who goes above and beyond to ensure students succeed both academically and professionally.