**LLMs in Action: Real-world Applications**

Using Large Language Models (LLMs) across Different Industries

Course Overview

Hi, everyone. My name is Amber Israelsen, and welcome to my course, LLMs in Action: Real‑World Applications. I’ve been a developer and technical trainer for almost two decades now, and in recent years have focused on machine learning, artificial intelligence, and cloud technologies for Pluralsight and other companies. Large language models, or LLMs, like ChatGPT, Bard, and Bing are all the rage these days and making a huge impact. In fact, McKinsey & Company estimates that generative AI will add the equivalent of $2.6 to $4.4 trillion in value across industries. But because this technology is so new, you might not even know where to start with it in your field or at your company specifically. This course will teach you real‑world applications and success stories, as well as innovative uses for LLMs across a variety of industries. Some of the major topics we’ll cover include real‑world applications of LLMs in healthcare, the financial sector, e‑commerce and retail, and media and entertainment, innovative and novel ways to use LLMs, and recent success stories and the impacts of this transformative technology. By the end of this course, you’ll have the skills and knowledge of LLMs needed to apply them in a practical way across a variety of fields. Before beginning the course, you should have a general familiarity with LLMs and what they’re used for. And ideally, you should have used tools like ChatGPT, OpenAI’s Playground, Bard, or Bing. From here, you should feel comfortable diving further into generative AI technologies with courses on prompt engineering. I hope you join me on this journey to learn how to get more from large language models with the LLMs in Action: Real‑world Applications course at Pluralsight.

Using Large Language Models (LLMs) across Different Industries

Course Introduction and Tooling

Large language models, or LLMs; everybody’s talking about them, and it seems like everybody has their own these days as well. You might have used LLMs like ChatGPT to write an email to your boss, or maybe you prefer another tool like Bard or Bing. If we go into Bard, let’s upload an image of a website mock‑up and then ask it to generate some code to create a webpage that looks like that. And there we go. There are plenty of other examples and tools as well. But as you’re thinking about LLMs and how you can utilize them at work, it’s sometimes hard to know what are other organizations doing and how can you use their success stories for your own inspiration? And that’s what we’re going to cover in this course. Hi, I’m Amber Israelsen, and thanks for joining me. Before we dive in, just a quick word about what this course is not. Our focus here will be on large language models generally, but not any particular tool. For the demos, I will be using ChatGPT, the OpenAI Playground, and Google’s Bard, but there are plenty of other LLMs out there, Bing Chat, Meta’s Llama, Amazon’s Bedrock that uses various models, Grok, and a lot of others. They all have their nuances, but in general, all LLMs are trained on a massive amount of data, and they’re able to process the data and have conversations in a very human‑like way. And this course will focus on how to use LLMs in the real world.

LLMs in Healthcare

Let’s take a look at how LLMs can be used in healthcare, with the giant caveat that healthcare is highly regulated, privacy is super important, malpractice and so on should not be underestimated, and obviously, an LLM is not a replacement for actual doctors and medical advice. But assuming you have the proper guardrails in place, let’s see some ways that you could use an LLM. We’ll take a look at medical note summarization, how to use it for Q&A, or question and answer, and then for diagnostic assistance as well. Starting with *medical note summarization*. We’re going to head out to the OpenAI Playground for this one. Summarizing notes is the perfect job for a large language model. During a medical visit, the doctor or nurse is probably jotting down rough notes, maybe transcribing them later, and LLM can rewrite or summarize those in a particular format. Over here in the system window, let’s give it some background that we’re going to be providing medical notes. We want them summarized in a short concise paragraph. And then over here, we can actually enter the notes, just a rough bullet point list for now. And then let’s get that nice paragraph. Perfect. There we go. And we can do the opposite. We could say summarize the notes into a short bullet point list. And then over here, rather than providing the bullet point list, let’s say you had these notes in paragraph form, and then the model can transform those into the bullet point list. Okay, let me clear all of this out. I’ll just refresh the page. And now let’s see how LLMs could be used as a *Q&A chatbot* to give general and basic medical information. Again, this shouldn’t be a replacement for professional medical advice, but it could give broad information. Let’s say, for example, the user asks what are symptoms of the common cold? We’ll get some general symptoms. Or we could ask, how can I lower my blood pressure? Once again, we’ll get some general advice here. But of course, with the reminder to consult your doctor before implementing anything. Then the third use case we’ll look at is *diagnostic assistance*. A model could help interpret symptoms and suggest possible causes, again, with all of the usual caveats. So we could say I’ve been having headaches, nausea, dizziness, can you help understand why? And we’ll get a list of potential causes here. Or I have a sore throat, fever, and a persistent cough. Can this indicate something serious? The model will give us some general ideas of what could be going on, as well as things that we could do in the meantime, while we wait for medical advice. So those are three ways that you could use a large language model in the field of healthcare.

LLMs in the Financial Sector

How can LLMs be used in the financial sector? Let’s look at some examples with the usual caveats that you shouldn’t take financial advice from an AI, and always validate the output that it gives you. Specifically, we’ll take a look at *automated report generation, as well as risk analysis*. For this one, let’s move over to ChatGPT. We want to create a report about Microsoft’s last quarterly earnings, but first, we need some help extracting data. On Microsoft’s site, I’ve got the press release open here. So let me just grab this text. I’ll just copy down through this first table right here, and we’ll take that back over to ChatGPT. Specifically, we’re looking for revenue, operating income, and net income, and we want those as bullet points. I’ll add a delimiter here just so the model can separate our instructions from the input text. Paste that in, and let’s see what we get. Perfect. It looks like it extracted what we want. Now, let’s ask for a chart to visualize the data. Very nice. Here is a bar chart for us, and it’s even giving us a comparison year over year of the first quarter results. I could then take this, put it into a PowerPoint presentation, an email, or what have you, and share it with others. Let’s see another example where you already have the data locally. Here, for example, I have some sample data in a CSV file. Just open it up in Notepad. And we’re going to say this is the net income for the companies for the last six years. So I can take this data, I’ll copy it. Back in ChatGPT, we’ll say below is data in a CSV format, describe the data, and then we want a summary in bullet points, as well as a line chart to visualize it. I’ll add my delimiter, paste that data in, and let’s see what we get. Okay, fantastic! Let’s see what we got. Here’s the line chart that we asked for. And then we’ve got a summary in bullet points just like we asked for. And now let’s say we want to use this data to generate an email to my boss. We want 2‑3 paragraphs summarizing the data. And here’s an email that we could use to get started. We’d obviously want to update this with our own voice, but it should have a summary of all of our data. We could also grab that line chart and include it in the email as well. So this is some way that you can use a large language model to help you generate reports. Now, let’s look at our second use case of risk analysis. Here we’re going to provide a sample investment portfolio, and we want some help identifying potential risk factors for the portfolio, considering things like diversification, sector performance, and so on. We’ve got the details of the different holdings down here, the stocks that we own, and then some more information about market conditions. This is all just sample data, but let’s see what kind of analysis we’ll get. Okay, we’ve got a pretty thorough analysis here. Looks like we’re doing well on diversification. We’ve got detail here about the sector performance, market conditions, some pros and some cons, some company‑specific risks, market risks, and so on. So that’s yet another way you could use a large language model in the financial sector.

LLMs in e-Commerce and Retail

Let’s take a look at how large language models could be used in e‑commerce and retail. Specifically, we will demo the use cases for customer support, product descriptions, and analysis of reviews. For our *customer support scenario*, let’s switch over to the OpenAI Playground here, and in the system message, we’ll give the model some instructions here. It is supposed to help with e‑commerce orders, inquiries, and issues, provide accurate information about product shipping and returns in a friendly and polite manner. So just giving it some background and context to help as it’s answering questions. Now, when a user comes along, they could submit a question like this, I ordered a pair of shoes last week and I still haven’t received them. The assistant is going to ask for an order number, so I’ll just make one up here. There we go. Okay, thank you for providing the order. I’m checking the status. Looks like it’s been shipped, it’s currently en route. And we could continue the conversation. Maybe, how do I return a product if it doesn’t fit? And here the model is just giving some general guidance. In the real world, you’d want to train it on your own data so that it knows your return policy and so on. But this is a very useful way to use a large LLM in an e‑commerce or retail scenario. Let me clear everything out here, and we’ll take a look at our next use case, which is *product descriptions*. This is the perfect job for an LLM. Something like this. We’ve got a smart Wi‑Fi plug that can be controlled via a mobile app and is also compatible with Alexa and Google Home. And here’s a solid start to the product description. Obviously, you’d want to modify it to match your brand’s voice and that type of thing, but it’s a good start. Let’s try it one more. Here we’ve got an Artisan Roasted Organic Coffee, providing some description about the taste and so on. Let’s get a description for this one. And there we go. Another description we could take and use for our product. Let’s take a look at one more use case, and that’s to do *analysis of reviews*. We all know how important reviews are. You probably use them all the time when you’re purchasing products. So let’s see how we can get some help from an LLM here. I’ve got 20 reviews, and I want to do some sentiment analysis on the reviews. So we’ll enter those and Submit. Okay, so it looks like it’s giving us sentiment, and a little bit more detail about each one of these. Then let’s ask for a summary, giving percentages for each category. And there we go. Looks like the majority are positive, but still quite a few negative, and then one neutral. You could take it one step farther and say based on these reviews, what action could I take to improve customer satisfaction? Okay, here we go. So based on just that handful of reviews that we put in, we’ve got some very actionable things that we could do here to improve our products in the future. So those are three ways that you could use a large language model in retail or e‑commerce.

LLMs in Media and Entertainment

The media and entertainment industry is full of opportunity for large language models. Let’s take a look at those. Specifically, we’ll take a look at *content generation*, script assistance, and personalized recommendations. Let’s switch over to Google Bard for some help on this one. Let’s say you need some help creating a plot for a video game. I’m designing a survival video game set at a deserted Antarctic research station. Give some information about the main character, why they’re at that station. But everything is not as it seems when he arrives, and it wants some help to generate a tentative plot for the game. Let’s see what we get. Okay, here’s our tentative plot. We’ve even got a game title, the premise, the plot outline, the gameplay, and so on. Pretty cool. Let’s try another one to help with character development. Here we’re conceptualizing a character for a new TV drama series. The character is Amelia. We’re giving a little bit of background, but we need some help constructing a detailed and compelling backstory for Amelia. And once again, we get a pretty solid start here that we could then take and build on. Kind of along these same lines, our second use case was *script assistance*. Maybe you need to write a dialogue for a movie. We’re writing a sci‑fi movie script where humans and aliens co‑exist on earth. We want the model to propose a dialogue between the alien character and the human protagonist as they discuss their different cultures. And here we go, it’s written a scene for us. We’ve got the back‑and‑forth between our two different characters. This is a dialogue that would help get us started. And then one more example related to script assistance. Let’s say that you need some help generating additional or bonus content for a movie, perhaps. Here we’re writing a behind the scenes interview with John Afterman. He’s our defense attorney from the TV legal series who just won a case, and I need some help generating this dialogue. And like magic, just like we asked for, here’s the dialogue for the interview that we could use. The third use case for media and entertainment was around *personalized recommendations*. For this, let’s head back over to the OpenAI Playground and see some examples. In the system window, we’ll just provide some background and context here. You’re an AI developed for personalized TV show recommendations. You understand genres, popular shows, and so on. The user is going to want suggestions for TV shows to watch. And the model should ask specific questions to help understand the user’s tastes, but only one question at a time. Then a user could say, "Hi, I’m looking for TV show recommendations," And the model will prompt for a couple of our favorite TV shows. Let’s say Seinfeld and The Office. Great. It seems you enjoy sitcoms with witty humor? Yes. And then it’ll continue on the conversation, asking about genre and so on. We could do something similar for video games. Let me just clear everything out here. We’ll just keep things simple and just go with the user message, "I need a new video game to play. I’m into action adventure games." And the assistant should give us a list of things that we could try out. So, there you have it. Those are three different ways that you could use a large language model in the media and entertainment space.

Exploring Innovative Use Cases and Success Stories for LLMs

Innovative and Novel Use Cases for LLMs

Coming up, let’s take a look at some innovative or novel ways to use large language models, things that maybe haven’t yet occurred to you, and then we’ll also see some success stories for how this kind of generative AI is being used by various organizations today. Specifically, for the innovative use cases, we’ll take a look at personalized tutoring, how to use LLMs in a disaster or emergency response situation, for environmental conservation, and for public policy and governance. For *personalized tutoring*, let’s start here in the OpenAI Playground. And the system message will give the model some background and context here. You’re a math tutor, and you need to evaluate if a student’s solution is correct. And then we provide the steps to figure out the solution and respond. First, we need to calculate the solution on our own. Compare that to the student’s solution. If the student’s solution is incorrect, we need to give a hint without giving away the answer, and then actually provide that hint. With that background in place, over here for user, here we can give the math problem along with the student’s solution, and then let’s see how the model responds. Okay, the model has followed our steps. It seems that the student’s solution is incorrect, and so the model will give a hint to the student without giving away the answer. So this can help the student learn and build on their knowledge until they get the correct response. Let me clear everything out here and we’ll talk about our next use case, which was around *disaster and emergency response*. For the system message here, we’ve captured social media posts relating to the disaster. And then over here in the user message, we want some help analyzing the sentiment, urgency, and type of needs based on these posts. And it looks like the model has given us what we asked for. We’ve got sentiment, urgency, and need based on these various posts. With this information, authorities could prioritize which areas need help the most. It could help them better communicate and manage their operations. For example, if there’s a lot of frustration that’s being sensed in this sentiment, they could assure the public about timelines and so forth. Or if there’s a lot of positive feedback, then they’ll know that their efforts are working. You could also build some type of chatbot to get somebody’s location, give them general instructions on what to do, and so on. Our third use case was around *environmental conservation*. And for this example, we’ll take a look at animal populations and patterns. This is just sample data that I’m using here about African elephants. But we could provide this as background. And then over in the user message, we could ask the model to analyze trends and offer potential reasons for the changes. And here’s a response related to trends and what might be going on. Another example where it could help us analyze trends would be around where to put renewable energy power plants. Clearing all of this out, assuming that we had a bunch of sample data around things like weather patterns, public sentiment, regulations, grid proximity, and so on, we could pass all of that in, ask the model to analyze things for us, and then analyze the suitability of where we could develop new power plants. I don’t have sample data for all of this, but that’s just one other example of an innovative way to use this technology. And then a couple more examples related to *public policy and governance*. For this one, over in the system message, let’s say that we’ve gathered feedback from citizens. And then over here on the user message, we want some help identifying common issues in that feedback based on the frequency of mentions. Based on our sample data, it looks like water supply issues are top of mind, followed by trash collection problems, and so on. And then one final example in this space is for policy analysis and summarization. This space involves a lot of legalese that might be a little bit difficult to sort through if you’re not an attorney, but you can ask for some help. Please provide a simple summary of the following excerpt from a new cybersecurity law, or it could be anything else. Let’s just see what we get. You can even ask for explanations for a five‑year‑old or on a funny tone or something like that if it makes it easier to understand. So, those are some examples of how you might use this technology in an innovative way that you hadn’t thought of before.

LLM Success Stories: Spotify

Now let’s take a look at how some organizations are using large language models today, starting with Spotify. Spotify, of course, is an online music streaming service, and they now have a new AI DJ that will give you personalized music lineups, as well as commentary about the tracks and artists using a very realistic AI‑generated voice. If you scroll down to how this all works, you’ll see that they’re using OpenAI technology to get insights into the music, the artists, and genres that you’re listening to. They then feed that text into an AI voice to basically act as your real life DJ. I’ll just give you a quick demo of this. This is the Spotify app on my desktop. This also works on the mobile apps. If we come into Made For You right here, you’ll see the DJ. And it’s playing some music based on my past history. But if we click this, get some different DJ picks. "Okay, up next, I’m going to keep it going with some of your usual Friday bars." And now we’re getting another personalized recommendation, along with that DJ voice in between. So I think it’s a great example of using large language models, as well as other A I tools for a very customized experience.

LLM Success Stories: LegalZoom

LegalZoom has launched a product based on generative AI to help you summarize documents. This product is called Doc Assist, and it combines the power of generative AI with LegalZoom’s expertise in legal. You can upload any legal document to pull out the core details, distill crucial clauses, and then it will ask insightful questions specific to that document. Let’s do a quick demo of this. Here I’ve got a sample residential lease agreement that I want to upload and have it summarize and pull out important information. So over here for Doc Assist, I will upload the PDF, and let Doc Assist go to work. So it’s extracting key facts and figures. Okay, it looks like it’s pulled out key facts here. They’re still processing, actually, but I’ve got quite a few. For clauses, if we hover over any of these, I’ve got a summary of the clause. And then it’s also pulled out some questions that might be relevant to this particular contract. So a nice way to use a large language model to extract key information and summarize the important points

LLM Success Stories: Hootsuite

Hootsuite is another company that’s been utilizing large language models and generative AI. If you aren’t familiar, Hootsuite is for managing your social media, and they’ve jumped on the AI bandwagon with a content generator called OwlyWriter AI. You’ll see here, this tool provides social marketers the opportunity to automate content creation tasks, simplifies writing processes, and so on. Let’s take a quick look at this one in action. And here’s how we can get some AI help with our content creation. Let’s just try a few of these. Let’s turn some web content into posts. So I can point this at a blog post or another content resource. I’ve got a Pluralsight blog that I have in mind. Let me show you that. A blog that I wrote about prompt engineering. So, let’s see what kind of post it’ll generate based on that blog. And here we go, we’ve got three examples that would get us started. From here, I can go and modify the posts and then make them live. Let’s do a couple more examples. Let’s start one from scratch, maybe a LinkedIn post. This one I want to be about large language models enabling productivity. So let’s see what we can generate here. And once again, it’s generated three different posts here that we could then take, modify, and then post. And then let’s do one more. How about Get inspired? Let’s try something other than large language models. Let’s talk about dog walking. Maybe you’ve got a dog walking business and you need some ideas of how you could post to promote your business. And several ideas here. Let’s try the first one, tips to motivate your dog to walk further. And once again, it’s used this large language model to generate some content for us that we could take, then post on all of our socials.

LLM Success Stories: Workday

In the enterprise cloud application space, let’s take a look at what Workday is doing. Perhaps you’ve used Workday for finance or human resources applications. They’ve incorporated quite a few generative AI features into their product. You’ll see just a few of the things here, like generating job descriptions, and so on. I can’t do a live demo of this one, but I do have some screenshots for you. This one here is showing how you could use AI to generate a job description, something that I don’t think any of us enjoy doing. You can also get help writing things like your frequently asked questions or policies. When you think about this kind of HR or talent management content, all companies have a lot of it, and if you can get some help from AI to write it or edit it, that can be a huge boost to productivity. You can also use AI to do contract review and find discrepancies. In this example, it looks like I found a discrepancy in the end date. You can compare that against the actual contract, and you can also get help with a proposed workflow, perhaps to update a contract or create schedules, create installments, and so on. So some nice ways that AI is making its way into the enterprise space.

LLM Success Stories: Shopify

A case study from the world of e‑commerce with Shopify. Here, you can build your own store and sell products online. They have a feature called Shopify Magic, which makes it really easy to generate product descriptions. Taking a look at a quick demo. Here I’m adding a product, and the little purple icon right here to generate text, I just need to give it some features and keywords for the product. Let’s say I’ve got a handmade coffee mug and I’m selling it with a bag of Italian roast coffee. I can choose the tone of voice, so a few different options here. I like the playful option. Let’s see what we get with that. And then we can also say, "Use coffee mug emojis," or other special instructions, and then let’s generate. All right, here’s my suggestion. I’m not seeing my emojis, though. Let’s try again, see if we get another one. Still no coffee mug emojis, but I get some other ones. So let’s say we like that. That will fill in our product description, and then we can go on with completing the rest of the product. So another example of using a large language model to generate content and save yourself a bunch of time.