

An antidamping spin orbit torque originating from the

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What is the spin-orbit torque theory? Spin torque is typically classified based on how the spin current is generated and injected into a magnet for manipulation. Spin-orbit torque arises from the spin-orbit interaction in a nearby normal metal, while spin-transfer torque results from exchange interactions in another ferromagnet.

What are spin-orbit torques in magnetic materials? Spin-orbit torque (SOT), exerted by the spin current on the magnetization, originates from spin-orbit coupling effects such as the spin Hall effect, anomalous Hall effect, and Rashba effect. Compared to the classic spin-transfer torque (STT), SOT exhibits superior performance in terms of efficiency and speed.

What is the difference between spin-orbit torque and spin-transfer torque? Depending on what is expected to be the dominant effect, STT is also described as damping-like (DL) torque, while SOT is often described as a field-like (FL) torque, leading to magnetization precession around the itinerant spin polarization.

What is the theory of spin-transfer torque? Spin-transfer torque (STT) is an effect in which the orientation of a magnetic layer in a magnetic tunnel junction or spin valve can be modified using a spin-polarized current. A simple model of spin-transfer torque for two anti-aligned layers. Current flowing out of the fixed layer is spin-polarized.

What causes spin-orbit interaction? In semiconductors, the spin-orbit interaction depends not only on the velocity of the electron (or its quasi-momentum), but also on the structure of the Bloch functions defining the motion on the atomic scale. Like in isolated atoms, it defines the values of the electron g-factors.

What is current induced spin-orbit torque? The current-induced spin-orbit torques change the magnetization angle relative to the external magnetic field due to the activation of resonant and nonresonant oscillations, coherent rotation, or domain wall motion. These dynamic changes are detectable by either electrical or optical method.

What is the formula for spin magnetism? $\mu_B n(n+2)$ where n = Number of unpaired electrons. Was this answer helpful?

What is spinning torque? Torque is a measure of how much a force acting on an object causes that object to rotate. The object rotates about an axis, which we will call the pivot point, and will label 'O'.

What are the advantages of spin orbit coupling? Based on the notion of effective magnetic field, it will be straightforward to conceive that spin orbit coupling can be a natural, non-magnetic means of generating spin-polarized electron current. It is thus natural to conceive that SOC within a tunnel barrier can be utilized to achieve efficient spin filtering.

What is the difference between deflecting and damping torque? In absence of controlling torque, the pointer will swing beyond its final steady-state position and the deflection will be indefinite. Damping torque: Deflecting torque is used for deflection, the controlling torque acts opposite to the deflecting torque.

What is the difference between torque and precession? Further, the torque is always (approximately) perpendicular to L , so the motion is circular – it is called precession. The precession rate is proportional to the torque, so increased lever arm for the weight makes it precess faster. But an increased rate of spin ω would increase L and thus make it precess more slowly.

How does spin-orbit torque work? In the phenomenon known as spin-orbit torque, an electrical current flowing through a bilayer consisting of a heavy metal and a ferromagnet can give a jolt to the magnetization in the ferromagnet. The effect may make possible a novel kind of magnetic memory and other electronic devices.

What is the power of rotation torque? The mechanical work required for or applied during rotation is the torque times the rotation angle. The instantaneous power of an angularly accelerating body is the torque times the angular velocity.

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What is the formula for torque of rotation? A particle is located at position r relative to its axis of rotation. When a force F is applied to the particle, only the perpendicular component F_{\perp} produces a torque. This torque $\tau = r \times F$ has magnitude $\tau = |r| |F_{\perp}| = |r| |F| \sin \theta$ and is directed outward from the page.

What is the Thomas precession of spin-orbit? In physics, the Thomas precession, named after Llewellyn Thomas, is a relativistic correction that applies to the spin of an elementary particle or the rotation of a macroscopic gyroscope and relates the angular velocity of the spin of a particle following a curvilinear orbit to the angular velocity of the orbital ...

What is another name for spin-orbit coupling? The magnetic fields created by S and L are not isolated from one another; they interact through spin-orbit coupling (aka Russell-Saunders coupling). We will consider only this simple form of coupling in this text. Its application is limited to the elements with z_{40} , including the first row of the transition elements.

What is spin-orbit coupling for dummies? 'Spin-orbit coupling' is a mechanism whereby the orbital angular momentum of outer electrons (in atoms of the same or other molecules) interacts with the spin of the excited electron, assisting a spin flip.

What is the spin state theory? A spin state in chemistry refers to the different possible configurations of electron spins within a molecule or complex. It is a significant factor in determining the electronic structure and properties of compounds, often revealed through vibrational spectra analysis.

What is the spin diffusion theory? Spin diffusion is an effect driven by homonuclear dipolar interactions between abundant spins, mostly protons, by which magnetization is transported between spatially fixed spins over distances as large as some 100 nm by a quantum-mechanical flip-flop process.

What is the spinning sphere theory? In Spinning Sphere Theory, the universe is spinning and the universe is a sphere made of spheres. When packing spheres in a spherical shape many imperfections or discontinuities are formed. These are postulated to be the basis for matter.

What is the spin particle theory? Spin is an intrinsic form of angular momentum carried by elementary particles, and thus by composite particles such as hadrons, atomic nuclei, and atoms. Spin is quantized, and accurate models for the interaction with spin require relativistic quantum mechanics or quantum field theory.

What is the index of a song? Song indexes include lists of songs – sometimes arranged by song title, sometimes arranged by composer, sometimes both – and provide cross-references for the anthologies that include each song.

What is the total number of songs? Determining the exact count of official songs worldwide is challenging, given the dynamic nature of music production and cultural variations. However, it's estimated that the total number of official songs is in the region of 80 million.

Is there a database of songs? MusicBrainz is the largest community-maintained open source encyclopedia of music information globally. The MusicBrainz music community has nearly 1.3 million members with a database covering nearly 1 million artists and nearly 18 million songs from over 200 countries.

What is music indexing? Music Index is a citation index to music periodical literature and provides citations to book reviews, obituaries, news periodicals, and news and articles about music, musicians, and the music industry.

What does index mean in music? Music Index is a database with index and some linked full-text for a wide range of music magazines, journals, and other periodicals. It's a great place to search for articles in trade journals, like The Strad or Piano Magazine.

What is the index number in music? index number — generally, the specific transposition level applied to an operation (for instance, T3 refers to transposition up three half-steps). In twelve-tone music, the number used to designate the transposition level of a row form (including inverted row forms) is sometimes called an index number.

Is there an infinite number of songs?

What singer has the most number of songs? Asha Bhosle, the iconic Indian singer, holds the title for the most recorded artist in music history. Surpassing her sister Lata Mangeshkar's previous record of 25,000 songs, Bhosle's remarkable career spans over seven decades.

How many songs exist right now? As of 2022, there are approximately 82 million songs according to Spotify, 200 million songs according to Gracenote, and between 97 million to 230 million according to Google. However, since we're dealing with some outdated data, it's safe to assume that there are many more songs that have been released.

Is there a music search engine? Shazam - Music Discovery, Charts & Song Lyrics.

How to find song information?

What is the website for song info? MusicBrainz is an open music encyclopedia that collects music metadata and makes it available to the public. MusicBrainz aims to be: The ultimate source of music information by allowing anyone to contribute and releasing the data under open licenses.

What does indexing actually do? Indexing is the way to get an unordered table into an order that will maximize the query's efficiency while searching. When a table is unindexed, the order of the rows will likely not be discernible by the query as optimized in any way, and your query will therefore have to search through the rows linearly.

What are the three types of indexing? Indexing is a very useful technique that helps in optimizing the search time in database queries. The table of database indexing consists of a search key and pointer. There are four types of indexing: Primary, Secondary Clustering, and Multivalued Indexing. Primary indexing is divided into two types, dense and sparse.

What is audio indexing? Audio indexing, however, is mostly used to describe the pre-process of audio mining, in which the audio file is broken down into a searchable index of words.

What is the index of the record? A record index is used to support join functionality, and is needed only if a downstream component will need to request records by ID. For example, a cache needs to be able to respond to a record assembler's (left join) request for a particular record.

What is the index of a volume? A volume index or quantity index is a numerical time series measure designed to help compare how the production of some class of goods and/or services, taken as a whole, differs between time periods or geographical locations. Compare price index.

What is the index of music listening? This 8-item measure provides 3 indices of music engagement. Scores range from 1 to 25 on the Index of Music Listening (IML), with higher scores indicating more intense music listening. The Index of Music Training (IMT) assesses an individual's music education, higher scores indicate more musical training.

What is the index scale? An index is a way of compiling one score from a variety of questions or statements that represents a belief, feeling, or attitude. Scales, on the other hand, measure levels of intensity at the variable level, like how much a person agrees or disagrees with a particular statement.

System Engineer Interview Questions: Navigating the Technical Landscape

System engineers play a crucial role in designing, integrating, and maintaining complex technical systems. Interviewing for this position requires a comprehensive understanding of the field and the ability to articulate your skills effectively. Here are five essential questions and answers to help you prepare for a successful system engineer interview:

1. Describe your experience in system design and development.

Highlight your involvement in projects where you designed, implemented, or maintained large-scale systems. Emphasize your understanding of system architecture, requirements gathering, and project management principles. Describe your proficiency in using modeling tools and simulation techniques.

2. Explain your expertise in system integration.

Demonstrate your ability to integrate different components and subsystems into a seamless whole. Discuss your experience in interfacing with hardware, software, and network technologies. Highlight your understanding of data flow, protocols, and communication standards.

3. How do you approach system testing and validation?

System engineers must ensure that systems meet their performance and functional requirements. Explain your approach to testing and validation, including functional testing, performance testing, and regression testing. Discuss your experience in using automated testing tools and developing test plans.

4. Discuss your experience in system maintenance and support.

System engineers often play a key role in post-deployment maintenance and support. Describe your experience in diagnosing and resolving system issues, implementing upgrades, and providing technical support to end users. Emphasize your understanding of system monitoring techniques and your ability to work with customers.

5. How do you stay up-to-date with emerging technologies in system engineering?

System engineers must keep abreast of the latest developments in the field. Explain how you stay informed about new technologies, industry best practices, and regulatory requirements. Discuss your involvement in professional organizations or continuing education programs.

Sidekiq: Home Automation for Facebook

What is Sidekiq Home?

Sidekiq Home is a home automation platform that integrates with Facebook to provide voice control and automation for smart home devices. It allows users to control their lights, thermostats, and other smart devices using Facebook Messenger or the Sidekiq Home app.

How does Sidekiq Home work?

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Sidekiq Home connects to your smart devices through the Sidekiq Home Hub. Once connected, you can control your devices using the Sidekiq Home app or by sending voice commands through Facebook Messenger. For example, you can say "Hey Facebook, turn on the lights in the living room" to control your smart lights.

What are the benefits of using Sidekiq Home?

- **Voice control:** Control your smart devices using voice commands through Facebook Messenger.
- **Automation:** Create automated actions to control your devices based on time, location, or other triggers.
- **Remote access:** Control your smart devices from anywhere using the Sidekiq Home app.
- **Integration with Facebook:** Connect Sidekiq Home to your Facebook account to access voice control and automation from within Messenger.

How can I get started with Sidekiq Home?

To get started with Sidekiq Home, you will need:

- A Sidekiq Home Hub
- Smart devices that are compatible with Sidekiq Home
- A Facebook account

Once you have these requirements, you can download the Sidekiq Home app and follow the instructions to connect your devices and create automations.

Conclusion

Sidekiq Home is a convenient and easy-to-use home automation platform that integrates seamlessly with Facebook. With voice control, automation, and remote access, Sidekiq Home makes it easy to control your smart home devices and create a more comfortable and efficient living space.

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