“How to nail any type of Interview”

Summer Seminar Series for McCormick Graduate Students
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Objectives

• To better understand the interview process: the before, during, and after

• To be aware of the appropriate interviewing behaviors

• To learn about different interview strategies

• To practice interviewing skills
Before the Interview

- Research the industry/company
- Identify reasons for wanting to work or having interest in that industry/company
- Recall situations that show favorable behaviors/actions
- Analyze the skills the employer is seeking
- Practice answering common interview questions
- Prepare questions to ask the employer
- Obtain the appropriate attire for the interview
Job Details

The Advanced Accelerator Physics Department at Sandia National Laboratories in Albuquerque, NM has two openings for members of the technical staff. These would conduct accelerator-physics experiments at Sandia's Z, Mykonos, and LTD-III facilities, develop mathematical models of pulsed-power components and systems, perform analytic and numerical calculations, and publish results in premier peer-reviewed physics and engineering journals.

The principal goals of this work would be to improve the understanding of accelerator physics, apply the improved understanding to the development of advanced accelerator technology, use the technology to upgrade continually the Z, Mykonos, and LTD-III machines, and establish the technical foundation upon which we will build next-generation petawatt-class pulsed-power accelerators.

Work hazards: High voltage, lasers, x rays, neutron radiation, radioactive materials (such as tritium and activated stainless steel), special nuclear materials (such as plutonium and uranium), beryllium, asphyxiating gases (such as sulfur hexafluoride and helium), toxic chemicals, chemical explosives, elevated work platforms, confined spaces, overhead cranes, forklifts, open water tank, open oil tank, high-pressure systems, vacuum systems, and cryogenic systems.

Required

(1) A Ph.D. (or equivalent) in engineering, physics, or a related field.
(2) A strong desire and demonstrated ability to define, address, and solve difficult problems in a timely manner.
(3) A strong desire to work in advanced accelerator physics.
(4) A strong desire to work in a fast-paced and technically challenging research environment.
(5) A strong desire to work as a team member in large-scale state-of-the-art pulsed-power facilities.
(6) Strong interpersonal skills.
(7) A commitment to publishing results in premier peer-reviewed physics and engineering journals.
(8) The ability to obtain and maintain a U.S. DOE security clearance.

Desired

(1) A publication record that includes first-author peer reviewed journal articles.
(2) Experience in the field of advanced accelerator physics.
(3) Experience designing and fielding advanced pulsed-power components and systems.
(4) Experience designing and fielding current and voltage diagnostics.
(5) Experience with mechanical and vacuum systems.
(6) Experience with machine control systems.
(7) Experience with pulsed-power systems.
Skills/Qualities Sought

- Ability to learn
- Technical Skills
- Communication skills
- Critical thinking
- Personal management
- Teamwork
- Leadership
- Adaptability

- Organization Skills
- Motivation
- Problem Solving
- Maturity
- Professional Judgment

NOTE: Know the specific technical skills for your areas of interest!
Company/Industry Research

• Learn more about the industry
  • Wetfeet.com
  • Vault.com
  • Factiva.com
  • Informational Interviews & Networking

• Learn about the company
  • Crain’s Business
  • Glassdoor.com
  • Company Website
High-Current Linear Transformer Driver
Development at Sandia National Laboratories


Abstract—Most of the modern high-current high-voltage pulsed power generators require several stages of pulse conditioning (pulse forming) to convert the multi-microsecond pulses of the Marx generator output to the 40-800 ns pulses required by a number of applications including X-ray radiography, pulsed high-current linear accelerators, Z pinch, interelectrode compression, and inertial fusion energy drivers. This makes the devices large, cumbersome to operate, and expensive. Sandia, in collaboration with a number of other institutions, is developing a new paradigm in pulsed power technology: the linear transformer driver (LTD) technology. This technology, approach can provide very compact devices that can deliver very fast high-current and high-voltage pulses. The output pulse rise time and width can be easily tailored to the specific application needs. Trials of a large number of high-current pulses can be produced with variable interpulse separation from milliseconds to microseconds. Most importantly, these devices can be repetitively fired without the expensive specifications (usually 10%). Their footprint, as compared with current pulsed power accelerators, is considerably smaller since LTD does not require large oil and water tanks. This makes them ideally suited for applications that require portability. In this paper, we present Sandia National Laboratory's broad spectrum of developmental effort to design, construct and extensively validate the LTD pulsed power technology.

Index Terms—Accelerators, high-current devices, linear transformer drivers (LTDs), pulsed power.

I. INTRODUCTION

SANDIA, in collaboration with the High Current Electronic Institute (HCEI), Tomsk, Russia, is developing new fast high-current high-voltage induction accelerators based on the linear transformer driver (LTD) technology [1, 2]. LTD-based drivers are currently considered for many applications including X-ray radiography, very high current, Z-pinch drivers, interelectrode compression drivers, and Z pinch inertial fusion energy (IFE) LTD is a new method for constructing high-current high-voltage induction pulsed accelerators. The salient feature of the approach is switching and inductively adding the pulses at low voltage straight out of the capacitors through low-inductance transfer and soft iron core isolation. The pulse forming, capacitors and switches are enclosed inside the accelerating cavities. High-currents can be achieved by feeding each cavity with many capacitors connected in parallel in a circular array. High voltage is obtained by inductively adding the output voltage of many cavities in series. Utilizing the presently available technologies and switches, we can envision building the next generation of fast radiographic and Z-pinch drivers without the large Marx generators and voluminous oil-water tanks, pulse forming and pulse compression networks as in the case with the present technology drivers. Most importantly, they can be multiplexed with a repetition rate, in principle, up to the capacitor specifications. This makes LTD the driver of choice for HCEI where the required repetition rate is estimated to be 0.1 Hz [3]. Presently, we have in the High Current LTD Laboratory of Sandia a larger 0.5-MA 100-kV LTD cavity in a ground operated, and an even larger 1-MA LTD cavity operating in a single-shot mode at the University of Michigan. In parallel, we are preparing a new LTD laboratory, named MYKONOS, to house our ten 1-MA 100-kV LTD cavities recently constructed and received from the HCEI, Tomsk, Russia. The cavities are stackable and will be assembled in a 1-MV 1-MA voltage adder configuration enabling deionized water as an insulator. This will be the first induction voltage adder constructed and operated with a...
Types of Interviews

Traditional
- Interviewer ask open ended questions that often come from your resume.

Behavioral
- Based upon skills and competencies.

Technical
- Used to assess candidates for technical or specialist positions (Jobs in IT, Engineering / Science)

Case
- Commonly asked in consulting interviews. Interviewer will ask you a case and ask you to solve the problem.
Goals of the Interview

Goals of the Candidate (you):
• To obtain information about the job/organization.
• To communicate important information about yourself.
• To make a positive impression upon the employer.

Goals of the Interviewer:
• To promote the organization and attract the best candidate.
• To assess if qualifications match the job requirements.
• To determine candidate fit with the organization and staff.
Traditional Interviews

- Less common now due to popularity of behavioral and case interviews
- Tend to focus on hypothetical situations, management style
Tell me about yourself...

A common traditional question.

Importance:
• First Impression still malleable
• Tone of interview
• Provide depth to resume
• Insight into who you are

Share information the employer may not already know and present it in a way that connects to the position you are seeking.
Behavioral Interviewing

“The best predictor of future performance is past performance in similar situations.”

*Use the STAR technique*
- **S**ituation, or
- **T**ask, leading to the
- **A**ctions taken or not taken by the applicant, and the
- **R**esults or changes caused by these actions.
Behavioral Based Questions

• Tell me about a time that you worked on a team based project?

• Tell me about a time in which you received constructive feedback and how did you handle it.

• Tell me about a project that you initiated.
Technical Interviewing

• Questions asked about specific technical activities related to one’s work

• May require candidates to solve actual technical problems they face in the workplace
Technical Question

Write a function to print all the possible permutations of a string. Now, modify the algorithm to discard duplicates.

Below is a sample implementation that prints all possible permutations of a string:

```c
#include <iostream.h>
#include <string.h>

const int MAX_STR = 20;

void CopyStr(char *s2, char *s1, int i)
{
    for (int j = 0, k = 0, len = strlen(s2); j < len; j++) {
        if (i != j) {
            s1[k++] = s2[j];
        }
    }
}

Source: Jeeve Technologies LLC
Case Interviewing

It is a simulation, or role-play, where the interviewer is the client who has all the information.

Analytics

- Provide structure to unstructured problems.
- Break problems into components.
- Apply transparent, logical thinking to each component.
- Synthesize discussion into solution.

Poise

- Appear excited by the kinds of issues consultants face.
- Are not intimidated by process or problems.
- Assimilate information quickly and effectively.
- Ask insightful questions.

Source: Goizueta Business School / BCG
Think like a consultant

1. The team has been asked to look at a number of issues that the client is considering, including whether or not to start a customer loyalty programme. In helping the client decide on this issue, which two of the following arguments, if true, would you favour introducing such a loyalty programme?
   A. The client has increased sales by 15% in the last year.
   B. It will lead to an increase in revenues with no significant cost increase.
   C. Loyalty programmes have successfully been introduced at retail electronics chains.
   D. It will allow customer behaviour data to be collected.
   E. It will benefit the partner companies of the loyalty programme.

Correct answers:

1. B and D
2. It will lead to an increase in revenues with no significant cost increase.
3. It will allow customer behaviour data to be collected.

Source: McKinsey
Q. How many razor-blades are sold in the United States every year?

• Where to start?
  • Population of USA = 300 million

• Break population down
  • Males = 50% of 300 million = 150 million
  • Assume only males 18+ use blades = 75% of 150 million = 110 million

• Determine Usage
  • Assuming that, 70% use shaving blades (others go to barber, don’t shave etc), users = 80 million
  • Assuming users shave once in 2 days on average = 40 million shaves/ day
  • Assuming one blade is good for 2 shaves on average = 20 million blades/ day
  • Blades sold per year = 365 x 20 million = 7.3 billion
Asking Good Questions

- Prepare questions before the interview
- They should be thoughtful and relevant
- Address the position, skills, qualifications, etc…
- Avoid salary benefits and/or personal topics
Additional Tips

• Practice (mock interviewing)
• Pre-Interview & Greeting
• About Your Body Language
• Write a thank-you note / email
5 Common Pitfalls in Interviews

- Not able to articulate why you are a good candidate for the position.
- Candidate doesn’t know why he/she wants the job.
- Candidate doesn’t know anything about the company.
- Candidate doesn’t have any questions to ask.
- The interviewee is not personable, enthusiastic, or conversational.

Source: Vault.com