

From Classroom to Cleanroom

The Student Ambassador Program: *Bridging Students and the Semiconductor Industry*

A. Bornea
Technical University of Cluj-Napoca, Cluj-Napoca,
Romania



Abstract

As one of the first Student Ambassadors of the European Chips Skills Academy and chair of the inaugural student session at SEMICON Europa, Andra will share insights into the Ambassador Program — its mission, activities, and achievements to date. She will discuss how Ambassadors across Europe have contributed to promoting skills development, supporting ECSA events such as the Student Summits and Forums, and fostering collaboration between academia and industry. Drawing from her own journey, Andra will also reflect on how this experience inspired her to pursue a career in the semiconductor field, transitioning from telecommunications studies to an engineering role at Infineon Technologies.

Biography

Andra recently graduated with a Bachelor's degree in *Telecommunications Technologies and Systems* from the Technical University of Cluj-Napoca, Romania, and is now pursuing a Master's degree in *Electronics Engineering* at the same university. She has gained extensive international experience through academic exchanges and research projects, including a semester at the Université de Technologie de Troyes in France and a summer internship on optoelectronics at the Université de Mons in Belgium. As one of the most active Student Ambassadors of the *European Chips Skills Academy (ECSA)*, Andra has been deeply involved in connecting students with the European semiconductor ecosystem.

References

Technologies of Interconnections in Electronics (TIE) Industry-Wide Student Challenge

O. Axinte
Technical University of Cluj-Napoca, Cluj-Napoca,
Romania

Abstract

The TIE Industry-Wide Student Challenge is a Romanian-born initiative uniting academia and industry in electronic packaging since 1992, engaging over 1,500 undergraduate and master's students from 11 universities to tackle real-world problems posed by companies like NXP, Bosch and Continental, under the motto "A way to turn your Hobby into Profession."

The challenge encompasses six specialized sections covering PCB design and electronic packaging: TIE-E (core electronics and PCB interconnection design), TIE-E+ (Signal and Power Integrity), TIE-M (mechanical CAD design for electronic packaging), TIE-M+ (structural analysis), TIE-T+ (thermal management optimization), and TIE- μ (advanced packaging including 2.5D/3D integration and chiplets).

While fueled by voluntary efforts, TIE's demonstrated impact on student learning, industry partnerships, and the microelectronics value chain highlights the need for EU funding to ensure sustainability, scale its reach across Europe, improve learning outcomes, and provide stable access to industry-standard CAD platforms.

Biography

Hi, I'm Octavian—a curious electronics engineer who started out wondering if the tiny black components on circuit boards were magic. What began as a mystery during high-school and university became a passionate dive into signal and power integrity. Along the way, I've enjoyed teaching, competing in industry challenges, designing PCBs at work and researching!

References

Establishing a student organisation in the semiconductor industry

A. Mészáros
Student; Electrical Engineering BSc
Budapest University of Technology and
Economics, Budapest, Hungary



Abstract

This presentation focuses on the establishment of a student organization within the semiconductor industry, also to inspire, and support Ambassadors in taking steps toward building sustainable student-led initiatives in the semiconductor field.

I aim to highlight both the challenges, including student turnover and the need for access to specialized equipment and opportunities, such as networking and skill development that come with initiating such an effort. I also want to give a framework and practical insights into how fellow Ambassadors can create similar organizations at their own institutions.

I will share the specific steps and requirements involved in founding a student branch at BME, while also outlining broader aspects that can be adapted to different university environments. I hope to show how such initiatives can create a community, enhance student engagement, and make connections between academia and industry.

The goal is to encourage collaboration, initiative, and long-term engagement among students interested in the semiconductor field.

Biography

My name is András Mészáros, I'm 24 years old and currently in my fourth year of the Electrical Engineering BSc program at the Budapest University of Technology and Economics (BME). I've chosen to specialize in microelectronic design and integration, and my thesis focuses on the modelling of tandem solar cells.

In June 2025, I had the opportunity to join the European Chips Skills Academy (ECSA) Student Ambassador Programme. Since then, I've volunteered at the ECS Summer School held at BME, and I'm currently working on establishing a student branch of ECSA at the university.

Beyond my academic activities, I'm deeply interested in exploring the various facets of the semiconductor industry, especially given its interdisciplinary nature.

References

Young Neuromorphs

N. Beladel
ETH Zürich, Zürich, Switzerland

Abstract

To be added

Biography

To be added

References

Assessing the human cost of PCB assembly production

L. Sondakh
Ghent University, Ghent, Belgium



Abstract

As a response to and driver of our ever-growing demand for more advanced digital technologies, the chip industry has been growing exponentially over the past few decades. Even more, the chip industry has become a crucial player within the European Union's economic strategy, as evidenced by the recent European Chips Act. However, this development comes at a significant cost. While recent EU efforts have been made in the research into the ecological cost of the production of chips, there is largely no research into the human cost. Nevertheless, many critical minerals are essential in sustaining the continued development of faster and better technologies. Some of these minerals are known to have a significant human cost, e.g. because they are a driver of local armed conflicts, because their mining exposes workers to toxic and/or dangerous working circumstances, or because their production process involves child labour. This thesis looks to provide an overview of the human cost of the materials used for and during the production of PCB assemblies in a systematic manner, hopefully providing an extra tool to aid chip designers in making informed design choices.

Biography

Laura Sondakh is a student ambassador of ECSA and a master's student at Ghent University, pursuing degrees in Electrical Engineering (Electronic Circuits and Systems) and Teaching (Science and Technology). At the intersection of these domains, she is passionate about advancing DEI within STEM education. For the past five years, she has been active as a student representative, advocating for inclusive education for all. She has developed course material to introduce children to STEM in an inclusive manner and volunteers as a tutor for vulnerable children, strengthening their mathematical and language skills. Her master's dissertation examines the human cost of electronics production.

References

Industrial Applications of Quantum Computing

V. Vulević
Telecommunications and IT student
University of Belgrade, Belgrade, Serbia



Abstract

Quantum computing marks a major turning point in the evolution of technology. Unlike classical systems that rely on bits holding a value of either zero or one, quantum computers use **qubits**, which can exist in multiple states at once through the principles of superposition and entanglement. These qubits are built into **quantum chips**, or Q-chips, using superconducting circuits, trapped ions, or photonic architectures. Recent progress in quantum hardware has moved the field beyond theory and experimentation, opening pathways for real industrial applications.

Across a range of industries, quantum computing is beginning to show practical promise. In logistics and manufacturing, companies are exploring quantum algorithms to optimize routes, scheduling, and production processes that would take classical computers far longer to solve. In material science and chemistry, quantum simulators are being used to model molecular behavior at the atomic level, helping design better catalysts, pharmaceuticals, and energy materials. Financial institutions are testing quantum systems for risk analysis, portfolio optimization, and fraud detection. Researchers in artificial intelligence are also investigating quantum-enhanced learning techniques that could accelerate data processing and pattern recognition. Meanwhile, advances in quantum cryptography are reshaping how organizations think about data protection in a post-quantum world.

As the number and stability of qubits increase, and as Q-chips become more reliable, the integration of quantum systems into real-world workflows is moving steadily forward. The coming decade is likely to see hybrid computing models, where classical and quantum processors work together to solve problems previously considered unsolvable. This talk will highlight how these developments are transforming industries and redefining the limits of computation.

Biography

Vuk Vulević is a third-year Telecommunications and IT student with a strong foundation in Internet of Things (IoT) technologies and data science. He has practical experience developing IoT projects that integrate connectivity and intelligent analytics. Passionate about innovation, Vuk is dedicated to creating solutions that make everyday life more efficient, connected, and convenient through smart technologies.

References

Reinforcing Skills in Chips Design for Europe - RESCHIP4EU



V. Cummings
Senior Manager, Workforce Development and EU
Projects
SEMI Europe, Brussels, Belgium

Abstract

RESCHIP4EU (“Reinforcing Skills in Chips Design for Europe”) is an EU-funded project coordinated by **EIT Digital** under the **Digital Europe Programme (Grant Agreement No. 101158828)**. The project tackles Europe’s growing skills gap in semiconductor and embedded-systems engineering, which is critical to achieving digital sovereignty and industrial competitiveness. Bringing together nine higher-education institutions from five European countries, alongside major industry partners such as **STMicroelectronics** and **SEMI Europe**, RESCHIP4EU is co-creating an innovative education model that blends academic excellence with strong industrial relevance.

At its core, the initiative establishes a **double-degree Master’s programme** in Embedded Systems Design, complemented by **self-standing online modules** in microelectronics and chip design, and a **minor in Innovation & Entrepreneurship**. This unique framework equips students with both deep technical expertise and an entrepreneurial mindset, spanning the full hardware-software stack.

Biography

Victoria Cummings joined **SEMI Europe** in 2023, where she leads initiatives in workforce development and coordinates European projects in the semiconductor sector. In her current role, Victoria acts as the **Coordinator for the European Chips Skills Academy (ECSA)** project—overseeing its implementation, stakeholder engagement, and alignment with industry and institutional actors across Europe. She is also involved in multiple complementary efforts linked to skills development and diversity in microelectronics. Before joining SEMI, Victoria served as a policy adviser working on EU regulation in areas such as financial services and energy markets. She holds a Master’s degree in Political Science from Boston University (2018).

References

Correlating Wafer Saw Dicing Parameters with Residual Strain in Microelectronic-Grade Silicon Wafers: Raman Spectroscopic Analysis

Z. Zainab
Research Assistant
Hochschule Anhalt, Köthen, Germany



Abstract

Saw dicing of silicon wafers is a high-pressure process that introduces non-visible defects like residual strain, compromising chip reliability. While many studies focus on feed speed and rotational speed independently, our investigation using Raman spectroscopy reveals that the feed rate per blade rotation ($\mu\text{m}/\text{revolution}$) is the dominant parameter controlling this strain. Our data shows a distinct threshold above which a significant increase in compressive strain occurs, evidenced by a Raman peak shift. This shows that the high-pressure phase transformation mechanism is inherent to ductile silicon removal. By identifying this specific process threshold, manufacturers can better optimize dicing parameters to minimize residual strain and improve wafer quality beyond what is possible with conventional optical inspection.

Biography

Zainab is a Research Associate at Hochschule Anhalt and a PhD candidate in Physics at Technical University Dortmund, specializing in semiconductor materials and processing. A recipient of the Erasmus Mundus Scholarship, she holds double Master's degrees from France and Germany and completed her research at the Paul Scherrer Institute (PSI), Switzerland. Her current work focuses on applying advanced optical techniques, including Raman spectroscopy, to study and reduce subsurface damage in silicon wafers.

References

Junior IOT: Chips in School workshop demo

M. van Schagen
Founder
Junior IOT, Alkmaar, The Netherlands

The logo for Junior IOT, featuring the words "Junior" and "IOT" in a bold, black, sans-serif font, stacked vertically on a bright yellow square background.

Abstract

This workshop 'Chips in Leds' is the starter workshop in the series 'Chips in Schools' by Junior IOT. Successive steps in this series are designed to awaken a strong interest into the specific beauty and attractiveness available in the broader chips industry. Each step is intended as an eye opener, aimed at a broad audience, including all ages and learning types. Activating for further learning by learner, teachers and institutes. The broad audience includes ages 6 up to 88.

With 'Chips in leds', participants playfully look at the innards of SMD leds. While they unknowingly make themselves acquainted with specific chip-scale structures and components, their task is to sort the items by type. They experience how the finer handling of both the microscopes and the tiny components helps them to achieve fun results, and they inspire and activate team members to try, experiment and enjoy.

Biography

In 2016, driven by my personal passion, I started the Junior IOT program for modern technology in education. Juniors learn the basic skills for modern technology, collaboration, daring to take control, and discovering 'what do I want'.

To this end, we cultivate an inspiring approach—without barriers—built on many small steps toward success. We work from the “inside of the machine,” so that after our workshops, there is immediate recognition of the inner workings of the technology in the world around us. Juniors realize that the world around them is “malleable” and that these skills help them shape it.

We invite partners to collaborate from their own perspective. Within this scope, we are happy to take on the role of the implementing partner. The Junior IOT machines, materials, subject teachers, and curriculum are already in place. By complementing each other, we make a real impact.

In collaboration with clients and partners, we focus on our hands-on workshops and prefer to leave theory and theme/application to the school's own education program. We see that our approach works very well for the students in this way.

Together, we can provide more technological inspiration to young people. This adds skills, gives them confidence, and makes them engaged. And that's what matters to us!

References