2023 SSCS Chapters Luncheon


alvin.loke@ieee.org
February 21, 2023
## Agenda

<table>
<thead>
<tr>
<th>Time</th>
<th>Item</th>
<th>Presenter</th>
</tr>
</thead>
<tbody>
<tr>
<td>12:00-12:10</td>
<td>Introductory Remarks</td>
<td>John Long, Dan Friedman</td>
</tr>
<tr>
<td>12:10-12:20</td>
<td>Chapter Awards, Recognition of Past Chapters Chair</td>
<td>John Long, Alvin Loke</td>
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<td>PICO Overview</td>
<td>Boris Murmann</td>
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<td>Young Professional (YP) Activities Overview</td>
<td>Korkut Kaan Tokgoz</td>
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<td>13:25-13:30</td>
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<td>Kathy Wilcox</td>
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<tr>
<td>13:35-13:50</td>
<td>Group Discussion</td>
<td>All</td>
</tr>
<tr>
<td>13:50-14:00</td>
<td>Group Photo</td>
<td>All</td>
</tr>
</tbody>
</table>
Opening Remarks

John Long  
jrlong@uwaterloo.ca  
SSCS President

Dan Friedman  
dfriedmn@us.ibm.com  
SSCS VP Membership
<table>
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<tr>
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</table>
SSCS OUTSTANDING CHAPTER AWARD

Chapter of the Year

IEEE SSCS Switzerland Chapter
IEEE INTERNATIONAL SOLID-STATE CIRCUITS CONFERENCE

SSCS OUTSTANDING CHAPTER AWARD 2022

SSCS Student Branch Chapter of the Year

IEEE EDS/SSCS University of Niš Student Branch Chapter
IEEE INTERNATIONAL SOLID-STATE CIRCUITS CONFERENCE

SSCS OUTSTANDING CHAPTER AWARD 2022

Muhammad Hunain Memon
Chair

Fujiang Lin
Faculty Advisor

SSCS Student Branch Chapter of the Year

IEEE SSCS University of Science and Technology of China Student Branch Chapter
IEEE INTERNATIONAL SOLID-STATE CIRCUITS CONFERENCE

SSCS OUTSTANDING CHAPTER AWARD 2022

Maxandre Fellmann
Chair

Yann Deval
Faculty Advisor

IEEE SSCS University of Bordeaux Student Branch Chapter

SSCS Chapter with Best Educational Program Award
IEEE INTERNATIONAL
SOLID-STATE CIRCUITS CONFERENCE

SSCS OUTSTANDING CHAPTER AWARD

IEEE SSCS KU Leuven Student Branch Chapter

IEEE SB

SSCS OUTSTANDING CHAPTER AWARD

Carl D’heer
Chair

Ariane De Vroede
Vice Chair

Jonas Pelgrims
Treasurer

Arnaud Van Mieghem
IEEE SB

Bram Veraverbeke
Media & Public Relations

Senne Gielen
Secretary

Berke Güngör
Member

IEEE SSCS KU Leuven Student Branch Chapter
IEEE INTERNATIONAL
SOLID-STATE CIRCUITS CONFERENCE

SSCS OUTSTANDING CHAPTER AWARD

SSCS Chapter with Best Pre-University Outreach Award

IEEE SSCS Ss. Cyril & Methodius University in Skopje Student Branch Chapter
Past Chapters Chair (2014–2021)

Stefan Rusu

THANK YOU FOR YOUR SERVICE!
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You All Serve a Critical Role – THANK YOU!!!

Local Membership
## Chapters Executive Summary

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<thead>
<tr>
<th>Category</th>
<th>Items</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Team Updates</strong></td>
<td>• New Vice Chair Makoto Nagata, New Administrators Ashley Seda, Aeisha Van Buskirk&lt;br&gt;• Chapters Steering Committee – formed Aug-2021, refreshed for 2023</td>
</tr>
<tr>
<td><strong>Chapter Count &amp; Activities</strong></td>
<td>• 128 chapters (50 SSCS-only, 41 Joint, 37 Student)&lt;br&gt;• 12 new chapters approved in 2022 (10 student chapters)&lt;br&gt;• 518 activities reported for 2022 (vtools)</td>
</tr>
<tr>
<td><strong>Communication</strong></td>
<td>• New Chapters Brief E-Newsletter Email – two issues (13-Apr-2022, 02-Nov-2022)&lt;br&gt;• Chapter mailing lists updated, regional lists ready for inter-chapter initiatives</td>
</tr>
<tr>
<td><strong>Activities</strong></td>
<td>• Webinar for Pre-University Engagement – Inspiring and Developing Tomorrow’s Circuit Stars&lt;br&gt;• Commemorative Lecturers for Transistor 75th Anniversary&lt;br&gt;• Chapters YouTube sub-channel going strong (27k views for top-5 videos)</td>
</tr>
<tr>
<td><strong>Recognition</strong></td>
<td>• 5 new awards approved (awarded at ISSCC 2023)&lt;br&gt;• Chapter Honor Roll (now 2nd year) on website</td>
</tr>
<tr>
<td><strong>Finance</strong></td>
<td>• 2022 – 42 subsidy requests; extra $14k disbursed for pre-college activities&lt;br&gt;• 2023 – 43 subsidy requests, to be disbursed following ISSCC</td>
</tr>
</tbody>
</table>
Chapters Core Team

THANK YOU!

Lauren Caruso

Congrats on your retirement!

Abira Altvater
abira.altvater@ieee.org

Congrats on your new role in PES!
You will do amazing things wherever you go!!!

Alvin Loke
alvin.loke@ieee.org
SSCS Chapters Chair

Makoto Nagata
nagata@cs.kobe-u.ac.jp
SSCS Chapters Vice Chair

Ashley Seda
ashley.seda@ieee.org
SSCS Administrator

Danielle Marinese
d.marinese@ieee.org
Senior SSCS Administrator

Aeisha Van Buskirk
a.vanbuskirk@ieee.org
Senior SSCS Administrator

Adam Greenberg
a.greenberg@ieee.org
SSCS Executive Director

Dan Friedman
dfriedmn@us.ibm.com
SSCS VP Membership

John Long
jrlong@uwaterloo.ca
SSCS President
Chapters Steering Committee

- Established in Aug-2021, updated for 2023
- Regional and gender diversity
- Student chapter inclusion

Thank you for your service!

Alvin Loke
Chapters Chair
California, USA

Sergio Bampi
Brazil

Victor Grimblatt
Chile

Brahim Mezghani
Tunisia

Sandra Veljkovic
Serbia

Andrea Baschirotto
Italy

Patrick Yue
Hong Kong, China

Makoto Nagata
Chapters Vice Chair
Japan

Bruce Doyle
Colorado, USA

Muhammad Hunain
Memon, China

Farhana Sheikh
Oregon, USA

Woogeun Rhee
China

Romane Dumont
France

Sharif Zadeh
California, USA

NEW

NEW

NEW

RETIRING MEMBERS

Patrick Yue
Hong Kong, China

Sharif Zadeh
California, USA

Woogeun Rhee
China

Romane Dumont
France

Patrick Yue
Hong Kong, China

Sharif Zadeh
California, USA
Recognition – New Expanded Chapter Awards

- Fully approved by Awards TAB in June 2022
- Please submit nominations when submission site opens in November

<table>
<thead>
<tr>
<th>No.</th>
<th>Award Name</th>
<th>Award Prize Per Chapter</th>
<th>2022 Recipients to be Recognized at ISSCC 2023 &amp; Chapters Luncheon</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Chapter of the Year</td>
<td>$ 1,500</td>
<td>Switzerland SSCS</td>
</tr>
<tr>
<td>2</td>
<td>Student Branch Chapter of the Year</td>
<td>$ 1,000</td>
<td>University of Nis EDS/SSCS Student Branch University of Science and Technology of China SSCS Student Branch</td>
</tr>
<tr>
<td>3</td>
<td>Chapter with Best Educational Program</td>
<td>$ 1,000</td>
<td>Bordeaux SSCS Student Branch KU Leuven SSCS Student Branch</td>
</tr>
<tr>
<td>4</td>
<td>Chapter with Best Distinguished Lecturer Program</td>
<td>$ 1,000</td>
<td>No award given for 2022</td>
</tr>
<tr>
<td>5</td>
<td>Chapter with Best Women-in-Circuits Program</td>
<td>$ 1,000</td>
<td>No award given for 2022</td>
</tr>
<tr>
<td>6</td>
<td>Chapter with Best Pre-University Outreach</td>
<td>$ 1,000</td>
<td>University of Skopje-Cyril &amp; Methodius SSCS Student Branch</td>
</tr>
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</table>
Recognition – Chapter Honor Roll

• Started in 2021 - [https://sscs.ieee.org/chapters/sscs-chapter-honor-roll](https://sscs.ieee.org/chapters/sscs-chapter-honor-roll)
• 2022 chapter honorees (to be posted to website after ISSCC 2023)

<table>
<thead>
<tr>
<th>Institution/Chapter</th>
<th>Location/Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bipin Tripathi</td>
<td>Kumaon Institute of Tech, SSC37</td>
</tr>
<tr>
<td>North Macedonia Jt Chap</td>
<td>ED15/IM09/SSC37</td>
</tr>
<tr>
<td>Nis Univ Of</td>
<td>ED15/SSC37</td>
</tr>
<tr>
<td>Tunisia Section</td>
<td>Chapter, SSC37</td>
</tr>
<tr>
<td>College of Engg</td>
<td>Karunagapperly, PHO/MTT/SSC/SP</td>
</tr>
<tr>
<td>University of China</td>
<td>SSC37</td>
</tr>
<tr>
<td>University of Skopje-Cyril &amp; Methodius</td>
<td>SSC</td>
</tr>
<tr>
<td>Serbia And Montenegro Section</td>
<td>ED15/SSC37</td>
</tr>
<tr>
<td>Malaysia Section Jt Chpt</td>
<td>ED15/MTT17/SSC37 Penang</td>
</tr>
<tr>
<td>National Engineering School of Sfax (ENIS), SSC27</td>
<td></td>
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<tr>
<td>Bangladesh Section</td>
<td>SSJ. Chapter, ED15/SSC37</td>
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<tr>
<td>Kolkata Section</td>
<td>Chapter, SSC37</td>
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<tr>
<td>San Diego Section</td>
<td>Chap, AP03/ED15/MTT17/SSC37/CAS04</td>
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<tr>
<td>France Section</td>
<td>Chapter, SSC37</td>
</tr>
<tr>
<td>Kerala Section</td>
<td>Chapter, SSC37</td>
</tr>
<tr>
<td>American Univ of</td>
<td>Sharjah, SSC37</td>
</tr>
<tr>
<td>Tainan Section</td>
<td>Chapter, SSC37</td>
</tr>
<tr>
<td>Singapore Section</td>
<td>Chapter, SSC37</td>
</tr>
<tr>
<td>Switzerland Section</td>
<td>Chapter, SSC37</td>
</tr>
<tr>
<td>Central Texas Section</td>
<td>Jt. Chapter, CAS/SSC</td>
</tr>
<tr>
<td>Huazhong Univ Of</td>
<td>Science And Tech, CAS04/SSC37/ED15</td>
</tr>
<tr>
<td>Kansai Section</td>
<td>SSC37</td>
</tr>
</tbody>
</table>
Healthy but aspiration is to maximize active chapters to maximize outreach to members!!!
### New & Dissolved Chapters

- **12 new chapters formed in 2022 (2 Regular, 10 Student)**
  1. University of Southern California, USA  
     Region 1-6
  2. Algeria Section, Algeria  
     Region 8
  3. Enugu State University of Science and Technology, Nigeria
  4. National Engineering School of Sfax (ENIS), Tunisia
  5. National School of Engineering of Sousse (ENISo), Tunisia
  6. Beijing Section, Tianjin, China
  7. Amal Jyothi College Of Engineering, India
  8. College of Engineering-Kallooppara, India
  9. Indian Institute of Science – Bangalore, India
  10. LBS Institute of Technology for Women, India
  11. Sri Sai Ram Engineering College, India
  12. VISAT Engineering College, Kerela, India

- **8 inactive chapters dissolved (1 SSCS-only, 1 Joint, 6 Student)**
Activities Reported on vtools

- Basic requirement: all chapters must report all activities on vtools

### Number of Reported 2022 Events

<table>
<thead>
<tr>
<th># of Events</th>
<th>Minimum to Stay Active</th>
<th>Minimum for Honor Roll</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>14</td>
<td>5</td>
</tr>
<tr>
<td>2</td>
<td>15</td>
<td>4</td>
</tr>
<tr>
<td>4</td>
<td>14</td>
<td>2</td>
</tr>
<tr>
<td>6</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>8</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>10</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>12+</td>
<td>14</td>
<td>2</td>
</tr>
</tbody>
</table>

### Number of Chapters

- Minimum to stay active: 49
- Minimum for honor roll: 14

#### Graphs

- **# reported events**: 350, 358, 366, 332, 301, 513, 518
- **# chapters reporting events**: 58, 66, 66, 66, 71, 68, 71, 85, 79

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SSCS Chapters Update
Activities – 2023 Distinguished Lecturer (DL) Roster

2022 - 2023

Jane Gu  Robert Henderson  Jaeha Kim  Tony Tae-Hyoung Kim  Nagendra Krishnapura
Carolina Mora Lopez  Hanh-Phuc Le  Yoonmyung Lee  Yan Lu  Danilo Manstretta
Matteo Perenzoni  Yvain Thonnart  Rangharajan Venkatesan  David Wentzloff  Wanghua Wu

2023 - 2024

Firooz Aflatouni  Sudipto Chakraborty  Fatih Hamzaoglu  Masum Hossain  Ping-Hsuan Hsieh
Dongsuk Jeon  JooYoung Kim  Andrea Mazzanti  Sugako Otani  Tim Piessens
Mingoo Seok  Farhana Sheikh  Alberto Valdes Garcia  Jeff Walling  Zhengya Zhang
Activities – Why Invite DLs

- Roster of well-known and established speakers
- SSCS (not chapter) pays for speaker’s travel
- OK to live-stream DL talks, not OK to publicly post DL slides or video until speaker’s term is over (make sure you have DL’s approval to record talk and post later)
- Must include/inform Naveen Verma (nverma@princeton.edu) in invitation email to DL speaker
- Inform Ashley once DL is secured for posting to chapter website
Activities – Commemorative Lecturers for Transistor
75th Anniversary

- EDS and SSCS are jointly offering series of initiatives to commemorate the 75th anniversary of the transistor invention (23-Dec-1947)
- Elite roster to present in-person/virtual SSCS/EDS chapter talks that offer historical perspectives of transistors and their applications
- Speaker travel budget same as for DL (max $3k/year)
  - Inviting chapter society pays speaker travel
  - SSCS and EDS split expense for joint chapters
- 10 SSCS Commemorative Lecturers
  - Christian Enz (EPFL, Switzerland)
  - Terri Fiez (U. Colorado – retired, USA)
  - Makoto Ikeda (U. Tokyo, Japan)
  - Thomas Lee (Stanford U., USA)
  - Nicky Lu (Etron, Taiwan)
  - Chris Mangelsdorf (ADI – retired, USA)
  - Bram Nauta (Twente U., Netherlands)
  - Carlo Samori (Politecnico Milano, Italy)
  - Viola Schaffer (TI, Germany)
  - Hoi-Jun Yoo (KAIST, Republic of Korea)

• Take advantage of this special opportunity!!!
Activities – YouTube Sub-Channel on Chapter Events

• Launched in April 2021 (linked to SSCS Channel)
• https://www.youtube.com/playlist?list=PLvYonHCKSWag8a_z2KH6XQVoeEl9GOQcw
• Please contribute your chapter videos

Top 5 Videos

<table>
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<tr>
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<th>Title</th>
<th>Views</th>
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<tr>
<td>1</td>
<td>50 Years of Computer Architecture: From Mainframe CPUs to DNN TPUs, David Patterson, Google Brain</td>
<td>14,783</td>
</tr>
<tr>
<td>2</td>
<td>High-Speed CMOS Serial Transmitters for 56-112Gb/s Electrical Interconnects Tod Dickson</td>
<td>4,158</td>
</tr>
<tr>
<td>3</td>
<td>Distinguished Talk 09: Nanoscale FinFET Technology for Circuit Designers - Dr. Alvin Loke</td>
<td>3,341</td>
</tr>
<tr>
<td>4</td>
<td>Quantum Computing: an IC Designer Perspective - Presented by Stefano Pellerano</td>
<td>2,561</td>
</tr>
<tr>
<td>5</td>
<td>Plasticine: A Reconfigurable Dataflow Architecture for Software 2.0, Kunle Olukotun, Stanford-Part 1</td>
<td>2,045</td>
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Activities – Pre-University Engagement

- Webinar - June 29, 2022 @ 7:00-8:15am PDT
- Inspiring and Developing Tomorrow’s Circuits Stars
- https://www.youtube.com/watch?v=NIkPZIY9L2w
- Speakers
  - John Long (introduction)
  - University of Nis Student Chapter Summary (Sandra Veljkovic)
  - Tunisia Chapter Summary (Brahim Mezghani)
  - Perspectives of Teaching Secondary School Electronics – Opportunities and Challenges (Tony Mauro, Canyon Crest Academy, San Diego)
  - SSCS PICO Program (Boris Murmann, Stanford)
Communication – Chapters Brief E-Newsletter

- 13-Apr-2022 (inaugural issue), 02-Nov-2022
- Target quarterly cadence going forward
- Content
  - Message from SSCS Chapters Chair
  - Meet the SSCS Chapters Team
  - SSCS 2021 Outstanding Chapter Award Recipients
  - SSCS Chapter Honor Roll
  - Officer Reporting – New Officer and Officer Changes
  - Reminder to Submit Chapter Activities to vtools
  - SSCS Tools & Links for Chapters
  - SSCS Distinguished Lecturer
  - SSCS Products for Chapters
  - Chapter Subsidies - Update
  - Call for Chapter News
  - Meet a Chapter Chair
- Resource to make announcements for other SSCS groups/activities, e.g., SSCD events, WiC, host-location chapters reach out to conferences
### Finance – Chapter Subsidies

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of Requesting Chapters</th>
<th>Total Requested</th>
<th>Total Approved</th>
<th>Allocated Budget</th>
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<tr>
<td>2021</td>
<td>36</td>
<td>$ 60,886</td>
<td>$ 70,100</td>
<td>$ 76,400</td>
</tr>
<tr>
<td>2022</td>
<td>42</td>
<td>$ 64,970</td>
<td>$ 67,100</td>
<td>$ 81,000</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>Pre-College</td>
<td>$ 14,000</td>
<td></td>
</tr>
<tr>
<td>2023</td>
<td>43</td>
<td>$ 66,850</td>
<td>$ 70,000</td>
<td>$ 81,000</td>
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- Annual subsidy limits: $2,000 (single), $1,000 (joint)
- Chapters now required to submit mandatory vtools reporting to receive subsidy
- New chapters automatically receive $1,000 or $2,000 subsidies
- Additional subsidy requests disbursed for pre-university activities (mid-October 2022)
- Pull in subsidy in 2023 – start disbursing immediately after ISSCC
- Submit your subsidy request in November 2023
New Initiative for Student Chapters – SSCS Tutoring

- **Vision:** SSCS in every circuits class
- Initiated by Ken O, SSCS Past President
- Recruit undergrad and grad student volunteers through IEEE and SSCS Student Chapters or other means to enhance the learning experience in basic electric and transistor circuits classes
- **Reward volunteers with IEEE and SSCS membership, and provide videos, shirts and other items with SSCS logos**
  - "When I had undergraduate tutors who have taken classes from me, my students have had better learning experiences. **My teaching evaluation was higher.**"
- Rewards based on tiers of volunteering hours – what do students want? IEEE and SSCS Membership (5 hours), Q&A with their favorite SSCS celebrity, SSCS website recognition based on hours of volunteering, Attendance to Circuits Insight.
- Pilot locations: UT Dallas, South Brazil, UC San Diego, Africa?
- Professors and Student chapter leaders: need your help!
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</tr>
</tbody>
</table>
Tony Mauro - Background

- BSEE 1988: Qualcomm Inc.
  - Digital Board Design
  - DSP
  - Security
  - Patent prosecution

- MSEE 1993: Magnavox Advanced Systems
  - Comm Systems
  - ASIC Design

- Teaching Credential 2007: Canyon Crest Academy
- Patent Agent 2008: NexStream Technical Education
- Canyon Crest Academy 2014
- NexStream Technical Education 2020
- UCSD Extended Studies 2022

- Instructor
  - Digital Design
  - AP Computer Science
  - Machine Learning
  - Engineering Internships

- UCSD
- NexStream
- Cal Poly Pomona

- Contacts: LinkedIn, NexStream, tony.mauro@sduhsd.net
High School Student Engagement
What works and what doesn’t

• Provide connections to market - what is used where?
  – Analog: Radio (filters), AC-DC conversion (rectifiers), Signal amplification and logic gates (transistors)
  – Digital: Computers (CPU pipeline, GPU), Vending machines, Garage door controller (state machines)

• Supplement with hands-on projects - must have!

• Digital units preferred. Why?
  – Projects aren’t as theoretical
  – Easier to connect to real world applications
  – Design software readily available (Logisim, Vivado)
  – Hardware readily available (SSI, MSI, FPGA)
Interactions (Internships and research)

- Provide Work-Based Learning (WBL) experiences
- Have implemented industry collaboration model in high school
- Extensible to post-secondary education
## Interaction Wish List

<table>
<thead>
<tr>
<th>Wish List (what?)</th>
<th>Target</th>
<th>Challenge (why?)</th>
<th>Possible Solutions/Benefits (how?)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Post secondary</td>
<td>Industry</td>
<td>No demand (?) Students less inclined to enroll in rigorous non-AP course</td>
</tr>
<tr>
<td>Marketing</td>
<td></td>
<td></td>
<td>Many cert programs available but value is questionable. Not built into course curriculum</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Programs are rigid, teacher are apprehensive</td>
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### Why is CS more popular than EE?

- Lower barrier to entry
- Better marketing- famous visionaries/founders
- AP courses (2), CTE pathways (2)
- More girls enrolled
## Interaction Wish List

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<td>Resources</td>
<td>Post secondary</td>
<td>Expensive, teacher lack of knowledge</td>
<td>Donations, training, e.g. space on a wafer</td>
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<tr>
<td></td>
<td>Industry</td>
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<td></td>
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<tr>
<td>● Tools/equipment</td>
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<td>Post secondary</td>
<td>Industry</td>
<td>Is it possible to create non-degree workforce training programs?</td>
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<td></td>
<td></td>
<td></td>
<td>Requires organization/funding (e.g. FIRST)</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Mentor responsibilities, engagement</td>
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<td></td>
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<td>Facility availability</td>
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<tr>
<td>Industry and Research-based internships</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Workforce readiness/training</td>
<td>✔️ ✔️</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Competitions</td>
<td>✔️ ✔️</td>
<td></td>
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<td>Research opportunities</td>
<td>✔️ ✔️</td>
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Bottom Line (Big asks) - What could IEEE do?

Engage College Board to create AP EE courses
  - Political and long schedule

Help create CTE (Career Technical Education) to pathways
  - Working on Machine Learning pathway now (3 course series)
  - CTE is more receptive than College Board

Help create pre-college course series with colleges
  - Working on Machine Learning with UCSD Futures (e.g. next slide)
  - Could leverage efforts with CTE
  - Need help with defining the curriculum map
    - What does a 3 course x 30 hr series look like?
    - Define the topics and I’ll create the curriculum
Thank you
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SSCS TC Open-Source Ecosystem - PICO Program Overview -

Boris Murmann
murmann@stanford.edu
January 26, 2023
Economic future of U.S. depends on making engineering cool

Purdue University races to expand semiconductor education to fill yawning workforce gap that threatens reshoring effort

By Jeanne Whalen
October 23, 2022 at 7:00 a.m. EDT
Today’s Competition for Talent

- Tech-savvy students at HW/SW intersection thrive on collaborative/maker culture
- Infrastructure enabled by integrated circuits!
Big-Bang Events: Open-Source PDKs

- First open-source PDK (November 2020)
  - SkyWater 130nm CMOS
    - [https://github.com/google/skywater-pdk](https://github.com/google/skywater-pdk)

- Second open-source PDK (October 2022)
  - GlobalFoundries 180nm MCU
    - [https://github.com/google/gf180mcu-pdk](https://github.com/google/gf180mcu-pdk)

- Permissive Apache 2.0 licensing
SSCS “PICO” Chipathon Overview

- 2021: 61 submissions, 18 selected (11 taped out)
- 2022: 54 submissions, 22 selected (14 taped out)

2022 selected teams from 10 countries, 5 continents

June 22, 2022, kick-off meetup with over 100 attendees
**Designs Taped Out in 2022**

<table>
<thead>
<tr>
<th>Function</th>
<th>Team</th>
<th>Chip URL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spatial Sigma-Delta ADC</td>
<td>Pakistan1 (FAST National University)</td>
<td><a href="https://platform.efabless.com/projects/1466">https://platform.efabless.com/projects/1466</a></td>
</tr>
<tr>
<td>On-Chip DCDC Converter with Fast Transient Response</td>
<td>Pakistan4 (FAST National University)</td>
<td></td>
</tr>
<tr>
<td>Matrix Multiplier for AI at the Edge</td>
<td>Pakistan7 (FAST National University)</td>
<td></td>
</tr>
<tr>
<td>Encrypted LSB Steganography with AES Accelerator</td>
<td>Pakistan2 (FAST National University)</td>
<td></td>
</tr>
<tr>
<td>CMOS Bandgap Reference</td>
<td>Pakistan3 (FAST National University)</td>
<td></td>
</tr>
<tr>
<td>Self-Interference Cancellation LNA</td>
<td>Pakistan4 (FAST National University)</td>
<td></td>
</tr>
<tr>
<td>Sub-Sampling PLL for SerDes Applications</td>
<td>Austria (Johannes Kepler Univ., Linz)</td>
<td></td>
</tr>
<tr>
<td>60 GHz Demonstrator Chip</td>
<td>Brazil (University of São Paulo)</td>
<td><a href="https://platform.efabless.com/projects/1431">https://platform.efabless.com/projects/1431</a></td>
</tr>
<tr>
<td>Low-Power 10-bit SAR ADC</td>
<td>USA1 (University of Alabama &amp; MIT Lincoln Lab)</td>
<td></td>
</tr>
<tr>
<td>Boost Converter for Battery-Powered IoT Applications</td>
<td>Greece (Aristotle University of Thessaloniki)</td>
<td><a href="https://platform.efabless.com/projects/1457">https://platform.efabless.com/projects/1457</a></td>
</tr>
<tr>
<td>Radiation-Hardened ALU</td>
<td>USA2 (North Carolina A&amp;T State University)</td>
<td><a href="https://platform.efabless.com/projects/1593">https://platform.efabless.com/projects/1593</a></td>
</tr>
<tr>
<td>DC-DC Buck Converter for CubeSat</td>
<td>Chile¹/Argentina²/Uruguay³</td>
<td><a href="https://platform.efabless.com/projects/1427">https://platform.efabless.com/projects/1427</a></td>
</tr>
<tr>
<td>Electrochemical Water Quality Monitoring</td>
<td>USA5 (University of Tennessee)</td>
<td><a href="https://platform.efabless.com/projects/1469">https://platform.efabless.com/projects/1469</a></td>
</tr>
<tr>
<td>Mix-Pix - A Mixed-Signal Circuit for Smart Imaging</td>
<td>Chile (Universidad del Bio-Bío)</td>
<td><a href="https://platform.efabless.com/projects/1494">https://platform.efabless.com/projects/1494</a></td>
</tr>
</tbody>
</table>

*$10k per chip via Efabless ChipIgnite*
ISSCC “Code-a-Chip” Travel Grant Awards

ISSCC “Code-a-Chip” Travel Grant Awards

SUBMISSION DEADLINE: NOVEMBER 21, 2022

The ISSCC 2023 Code-a-Chip Travel Grant Award was created to (1) promote reproducible chip design using open-source tools and notebook-driven design flows and (2) enable up-and-coming talents as well as seasoned open source enthusiasts to travel to the Conference and interact with the leading-edge chip design community. This program is made possible by a donation from the CHIPS Alliance, a non-profit organization hosted by The Linux Foundation.

Program rules
- The program is open to anyone (no restrictions). Membership in the IEEE Solid-State Circuits Society (SSCS) membership is encouraged, but not required. Teaming is encouraged, but each team must identify a single leader who can travel to the ISSCC from February 19-23, 2023, to receive the award.
- Applicants must submit an open-source Jupyter notebook detailing an innovative circuit design using open-source tools (examples: inverter, temperature sensor).
- Each submission must contain a suitable open source license (e.g., Apache 2.0).

https://sscs.ieee.org/membership/awards/ieee-sscs-code-a-chip-travel-grant-awards
Motivation: Reproducible IC Design

- It is common to publish with code in other disciplines
- Now also possible in IC design!
  - https://developers.google.com/silicon/guides/digital-inverter-openlane

Get OpenLane

$ git clone --depth=1 https://github.com/The-OpenROAD-Project/OpenLane

Write verilog

```verilog
module inverter(input wire in, output wire out);
  assign out = !in;
endmodule
```

Run OpenLane Flow

```bash
import os
import pathlib
OPENLANNCE_ROOT=str(pathlib.Path('OpenLane').resolve())
PATH=os.environ['PATH']
%env PDK_ROOT=(CONDA_PREFIX)/share/pdk
%env TCLLIBPATH=(CONDA_PREFIX)/lib/tcllib1.28
%env OPENLANCE_ROOT=(OPENLANNCE_ROOT)
%env PATH=(PATH):$(OPENLANCE_ROOT)::$(OPENLANNCE_ROOT)/scripts
%env OPENLANCE_LOCAL_INSTALL=1
flow.tcl -design
```
# 2023 Winners (Presented at ISSCC SRP Session)

<table>
<thead>
<tr>
<th>Name</th>
<th>Affiliation</th>
<th>Notebook Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yihai Zhang</td>
<td>Tsinghua-Berkeley Shenzhen Institute, Tsinghua University China</td>
<td>GreenRio 2: A Linux-compatible RISC-V Processor Developed with A Fully Open-Source EDA Flow</td>
</tr>
<tr>
<td>Anawin Opasatian</td>
<td>University of Tokyo (Japan)</td>
<td>Bernstein-Yang Modular Inversion with XLS/OpenLane</td>
</tr>
<tr>
<td>Mauricio Montanares</td>
<td>University of Concepción (Chile)</td>
<td>Sonar On Chip Project</td>
</tr>
<tr>
<td>Neelson Li</td>
<td>Georgia Institute of Technology (USA)</td>
<td>Coordinate Rotation Digital Computer (CORDIC) with OpenLane</td>
</tr>
<tr>
<td>HyungJoo Park</td>
<td>Hanyang University (South Korea)</td>
<td>Scan Register layout generation using laygo2</td>
</tr>
<tr>
<td>Ali Hammoud</td>
<td>University of Michigan (USA)</td>
<td>OpenFASoC: Digital LDO Generator</td>
</tr>
<tr>
<td>Nimish Shah</td>
<td>KU Leuven (Belgium)</td>
<td>DPU: DAG Processing Unit for probabilistic ML and sparse matrix algebra</td>
</tr>
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[https://github.com/sscs-ose/sscs-ose-code-a-chip.github.io](https://github.com/sscs-ose/sscs-ose-code-a-chip.github.io)
Start Here: TC-OSE GitHub Portal (https://sscs-ose.github.io/)

Introduction
Welcome to the IEEE Solid-State Circuits Society (SSCS) Open-Source Ecosystem (OSE) page! This site aims to provide links and hints to get you started using open-source IC design tools, especially if you want to participate in the SSCS PICO Chioathlon or the Code-a-Chip Travel Grant competition.

General Information About Open-Source IC Design
Open-source IC design tools have come a long way in the last few years. While the start can be confusing, plenty of information is freely available on the Internet.

Please look at Matt Venn’s collection of Awesome opensource ASIC resources to get you started. Many links are collected to several tools and information sites on this GitHub page. Generally, it is good to get a GitHub account since many of the relevant SW packages are hosted there.

In addition to GitHub, YouTube is a treasure trove of helpful information. Many users have published tutorials; sometimes, the lead developers of essential tools publish How-To videos themselves. Once you know what to look for, you will be able to find it. Hint: Search for a specific tool you want to learn.

Since the individual open-source SW packages evolve quickly, documentation is often lacking behind. Luckily, the open-source developer community is accessible, and very often, you can reach them directly on Slack to help you out. You should get access to skywater-rcfd-slack.com as this is the watering hole where everyone meets. There is also a dedicated channel for the 2022 Chipathon (#IEEE-sscs-dc-22).
Democratizing IC Design: The IEEE SSCS PICO Program

SSCS Technical Webinar Series

Democratizing IC Design: The IEEE SSCS PICO Program

Presented By: Boris Murmann
Professor of Electrical Engineering
Standford, California
Looking for More Volunteers!

- Possible tasks
  - Evaluate submissions and milestone reports
  - Attend weekly online meet-ups (~June-November)
  - Give a short “how to” presentation during online meetup
  - Provide technical guidance during meet-ups and via Chipathon Slack channel
  - Prepare online tutorials, webinars, chapter talks
  - Help with open-source tool & utility development

- Minimum time commitment of 1-2 hours per week
- Sign up at https://sscs.ieee.org/volunteer-opportunities#SSCD
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SSCS Chapters Lunch: Education

Feb. 21, 2023, San Francisco

Ali Sheikholeslami, SSCS Vice President, Education
SSCS Education Portfolio

- Distinguished Lecturer Program – Naveen Verma
- Webinar Program – Filip Tavernier
- Circuit Design Contest – Antonio Liscidini
- ISSCC Circuit Insights – Ali Sheikholeslami
- ISSCC Deep Dives (new) – Behzad Razavi
- SSCS Arduino Contest (new) – Jeremy Cosson-Martin
What is the Arduino Contest?

SSCS is running a competition throughout the USA and Canada challenging high-school and undergraduate students to compete for REAL CASH PRIZES!

Our Mission

To show how fun and easy electronics can be!

Join Us

as we learn to program Arduino microcontrollers and use numerous sensors, actuators, controls, and displays.

We supply:

* Tools * Lessons * Motivation

All you need is:

*Courage to take the first step!*

---

**Video Submission**

Include:

1. Introduction
2. School & Country
3. Demonstration
4. Discuss some challenges

Deadline: **April 30, 2023**

---

[Programs on the Rise: SSCS Arduino Contest](https://www.sscs-arduino-contest.com)
SSCS Arduino Contest: Introductory Video
https://www.sscs-arduino-contest.com

IEEE Solid State Circuits Society

How it works:
1. Join it
2. Get it
3. Learn it
4. Think it
5. Build it
6. Show it
SSCS Arduino Contest: Tutorials and Inspirations
https://www.sscs-arduino-contest.com

Unit 1: Basics
- Tutorial 0: Setting up Software
- Tutorial 1: Digital Outputs
- Tutorial 2: Digital Inputs
- Tutorial 3: Serial Bus
- Tutorial 4: Analog Inputs
- Tutorial 5: PWM Outputs

Unit 2: Inputs and Outputs
- Tutorial 6: DC Motors
- Tutorial 7: Servo Motors
- Tutorial 8: 7-Segment Display

15 Great Arduino Projects for Beginners
10 Arduino Projects with DIY Step by Step Tutorials
We Need Volunteers from Your Chapters

- SSCS Arduino Contest is ready for its debut pilot run in the US and Canada.
- The official competition website is available at www.sscs-arduino-contest.com
- We need volunteers! Please email jeremy.cosson.martin@mail.utoronto.ca

Each volunteer's role will include the following:

1. Advertising the competition to local high schools and universities/colleges
2. Ranking the submissions as they arrive
3. Brainstorming ideas to improve future competitions
## Agenda

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IEEE Solid-State Circuits Society
Young Professionals and Students Committee
Korkut K. Tokgoz, S. Zeynep Lulec, Chapters Luncheon
Feb 21st, 2023
YP Membership and Committee

- YPs are within the +15 years of their first graduation
- More than 30% of overall Solid-State Circuit Society membership
- YP Committee strives to address the needs and interests of our younger members
IEEE SSCS YP and Students Example Benefits

- Resource Center: Technical tutorials, short courses, webinars
- Distinguished Lectures in your local setting
- Student travel grants, predoctoral achievement awards, circuit design contests
- Up to $1,500 young leadership volunteer travel awards for SSCS conferences
- Encourage younger members to become a Young Professional (YP) leader in your local & global SSCS section
  - Make professional connections, develop leadership skills, give back to the community
IEEE SSCS Webinars for Young Excellence (WYE)

- **OPEN to ALL** Webinars for Young Excellence (WYE)
  - Launched in early 2020 and organized quarterly
  - Dedicated to Young Professionals but open to all members
  - Enhancement of the SSCS Webinar Program and other YP programs
  - Recordings are available on the [SSCS YouTube](#) channel

WYE Playlist

![WYE Playlist QR Code](#)
IEEE SSCS Online Mentoring Software: Chronus

- Online mentoring platform launched in 2020 - We are leading other IEEE Societies
- Matches based on your background and interests | 6-month mentoring program
- We ask all of you to join the next round as Mentors!

https://sscsmentoring.chronus.com/
Micro-Mentoring in SSCS Sponsored Conferences

- CICC
- VLSI
- ESSXXRC
- A-SSCC
- ISSCC
SSCS Young Professionals Leadership Grant

▪ **Motivation**
  ▪ YP volunteers are in their early careers. They may need support to attend conferences
  ▪ Encouragement to become a YP volunteer/leader/organizer at conferences

▪ **Selection & Eligibility**
  ▪ Support one YP mentoring session organizer per conference
  ▪ Selected within the YP Mentoring Session organizers
  ▪ Different volunteer for each conference, preferably someone who lives in/near the region

▪ **Budget**  
  $500/conference
  ▪ **Virtual:** Cover virtual conference attendance fees
  ▪ **In-person:** Prioritize volunteers that live in/near the region/continent
Welcome to the In-Person *Mentoring* Session
by IEEE Solid-State Circuits Society Young Professionals & Women in Circuits

Tuesday, Feb. 21\textsuperscript{st}, 6:00 – 7:00 PM Local Time (PST)
Room: Sierra A/B @ Marriott Marquis

Get career **advice** from leading industry experts & professors

**Ask** your questions in a relaxed atmosphere

Get familiar with IEEE SSCS membership benefits.

Refreshments will be provided.

**IN-PERSON EVENT**
**IN CONJUNCTION WITH**
**ISSCC 2023**
## Agenda

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IEEE Solid-State Circuits Society: Women in Circuits ISSCC 2023 Chapter Chairs Luncheon

Tuesday February 21, 2023

Farhana Sheikh
WiC Committee Chair

Kathy Wilcox
WiC Committee Co-Chair

Alice Wang
WiC Committee Advisor

sscs.ieee.org/women-in-circuits
### WIC Sub-Committees and WIC Leaders

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<td>Statistics</td>
<td>Alicia Klinefelter, Shalini Lal</td>
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<td>Mentoring Events</td>
<td>Zeynep Toprak Deniz, Zeynep Lulec (YP Chair)</td>
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<td>Professional Development</td>
<td>Deeksha Lal, Awani Khodkumbhe</td>
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<td>Shalini Lal, Aeisha VanBuskirk</td>
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<td>Family Care</td>
<td>Zeynep Toprak Deniz, Aeisha VanBuskirk</td>
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<td>SSCS Magazine</td>
<td>Danielle Marinese, Jane Gu</td>
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**IEEE WIE Representative:** Zeynep Toprak Deniz (2022 - 2024)
### Committee Overview

- Sub-Committee under SSCS Membership
- SSCS membership support & programs to improve gender diversity
- Statistics-driven programs to uplevel and increase diversity
- Increase diverse representation in academia & semiconductor industry
- Collaboration across SSCS AdCom Committees: YP, Chapters, Diversity, …
- Increase outreach in academia and industry
  - Focus on all levels: undergraduate, graduate, post-graduate

### Accomplishments

- Sub-committee organization to enable new leadership growth
- Wider-scale active participation from SSCS WIC members
- “Bring-a-friend to SSCS & WIC” program goal: females in SSCS
- Updated and improved statistics gathering automation
- Family Care @ SSCS Conferences proposal for 2024 pilot @ ISSCC
- Formalized participation in Women in Engineering
- First female plenary at A-SSCC 2022 diverse plenary list for SSCS
- STGA & mentoring grants: ISSCC, CICC, VLSI, ESSCIRC, ASSCC, Brain
- NextGen Designer Workshop @ ISSCC 2022
- Increase participation across SSCS conference TPCs, committees, publications, …

### Strategic Plan

- Address downward trend at senior level positions at conferences
- Address stagnant 5% - 10% representation at senior membership levels
- Better statistics from all SSCS conferences
- Outreach in collaboration with Diversity Committee and Chapters
- Significant update to diverse potential TPC members list
- Aggressive target: 30% representation by 2030
- Professional Development Program – incentives to increase membership

We need your help!

### Upcoming Programs & Initiatives

- Up-level of diverse SSCS members to Senior Member & Fellow
- Family Care @ SSCS Conferences: Pilot program for SSCS
- Conference statistics to inform all SSCS Conference leadership
- Outreach in collaboration with other SSCS committees, esp. Chapters
- SSCS Women in Circuits Award work with Awards Committee
- 30% representation by 2030 target
- Professional Development Program
- Continue collaboration with YP on Mentoring Events
- Continue student travel grant awards
- Regular WIC column in SSCS Magazine, and WIC Special Fall Issue
Abstract: Free webinar - open all, including non-IEEE members. This event will be recorded. Non-IEEE attendees are encouraged to become IEEE SSCS members to take advantage of the recording once it is available.

This webinar is for you if you have -
• ever had a toxic manager or advisor
• wished for a psychologically safe work or school environment
• wondered if managing or leading people is for you
• questioned if your team’s culture and impact could be managed differently
• been a chip or team leader but want to up your game
• felt like your career is stuck in office politics
• struggled to respond in situations of team conflict
• had a hard time innovating within deadlines in your team
• been unable to negotiate graduation or promotion with your advisor or manager

We invite three senior professionals with stellar managing, mentoring, and leadership experience, both in the industry and academia to provide their perspectives. They will share personal roadmaps to their management roles - and the why’s and how’s of what got them there.

Live Q&A session will follow the 15-minute speaker presentations.

Data and content courtesy of: Awani Khodkumbhe and Deeksha Lal
IEEE Women in Circuits
An SSCS Committee

Join us in the Women in Circuits Revolution!
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Committee

• Daniel Limbrick
  – North Carolina A&T

• Boris Murmann
  – Stanford University

• Aya Mouallem
  – grad student at Stanford University

• Charlotte Frenkel
  – University of Zurich [stepped down in fall 2022]

• Kwantae Kim
  – University of Zurich [started in fall 2022]

• Kofi Makinwa
  – Delft University of Technology

• Sergio Bampi
  – Federal Univ. of Rio Grande do Sul

• Fernanda Lima Kastensmidt
  – Federal Univ. of Rio Grande do Sul
Past work (2021/2022)

- IC Democratization
- Membership statistics
  - Region
  - Gender
  - Membership status
  - Industry vs. academia
  - Race
- Spending ideas
- Attended IEEE TAB Committee on Diversity and Inclusion Roundtables
  - SSCS is already doing many things other societies are doing
IEEE D&I Best Practices

- Diversity & Inclusion - IEEE Technical Activities Operations
- Link to IEEE Diversity Dashboard

Best Practices for Diversity and Inclusion in IEEE Societies and Councils

During the process of collecting diversity data from IEEE Societies and Councils, each was asked to respond to several open-ended questions about their efforts in diversity and inclusion around governance, membership, awards, and conferences. While some best practices were focused on these four areas, others cut across many Society/Council Activities. The responses are broken down as broad recommendations for best practices in all activities, as well as specific recommendations around the four categories.

- Best Practices for Diversity and Inclusion in IEEE Societies and Councils (DOC, 1.7MB)
Next Steps (2023)

- Need to turn our discussions into actual measurable actions
- Plan to spend $40K diversity project funds in 2023
  - Student travel grants
  - Distinguished Lecturer (or something similar) at universities
  - Outreach targeting middle school/high school
- Committee responsibilities
  - Everyone commit to a specific task
- Leverage relationships with other organizations for outreach
- Develop SSCS diversity website pages
- Collaborate with SSCS chapters
  - Outreach?
  - Regional diversity?
  - Gender/racial diversity in chapter membership?
  - Gender/racial diversity in chapter leadership?
  - Other thoughts?
IEEE Members by Region
(All Members)

- United States - Regions 1-6: 41.7%
- Asia & Pacific - Region 10: 32.9%
- Europe, Middle East, Africa - Region 8: 18.4%
- Canada - Region 7: 3.3%
- Latin America - Region 9: 3.3%

Young Professional Eligible
(All Members)

- YP Eligible: 22.1%
- Not YP Eligible: 74.2%

Gender of IEEE Members
(All Members)

- Female: 15.0%
- Male: 85.0%

Total Members in Region:
308,459

Last Updated: 23 March
Examples of some dashboard stats
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Chapter Chairs Luncheon – Conferences
Alessandro Piovaccari - piovac@gmail.com
February 21, 2023
Technical Co-Sponsored Events

In cooperation with local chapters

- Local/regional single events or with frequency less than once per year or single events
- Content may not be archived in IEEEXplore
  - Note: consider alternative way of archival – e.g. GDrive
- SSCS goals
  - Grow event attendance, SSCS participation and membership, chapter visibility and attendance
  - Grow and support emerging topics forums and technical communities
- Possibility to publicize through SSCS vehicles
  - Mail lists, newsletters, Magazine, ...
- Consider inviting DL as possible speakers
- Technical co-sponsorship approval through local chapter leadership
  - Events must meet IEEE criteria
  - Note: need to determine/verify and publish criteria
Collaboration with Local SSCS Chapters

Local support for FSC and TCS conferences

- Get your local SSCS chapters involved, and reach out early

- Chapters can help you in all sorts of ways
  - Advertise conference in local chapter mailing list, website, social media, newsletter, etc.
  - Plan fun local tours/activities for conference attendees (e.g. microbrewery, hike or other local activity, ...)
  - Leads to local universities – promote student participation
  - Help with local arrangements
  - Host conference speakers (e.g., DLs) at local chapter seminars
  - Be creative!

- Opportunity to engage with the local community, and promote our initiatives and values
  - Diversity and inclusion, WiC, YP, Circuits Insights, ...

- If you need chapter contacts, please reach out to
  - Chapters Chair Alvin Loke (alvin.loke@ieee.org)
  - Chapters Vice Chair Makoto Nagata (nagata@cs.kobe-u.ac.jp)
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Group Photo Time