David Hwang

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Summary

Motivated self-starter in my fourth year as a Ph.D. candidate in Materials Science & Engineering (MSE) pursuing a Research & Development internship utilizing analytical, management, and communication skills.

- Conducted 3+ years of independent research in the field of MSE and optoelectronics with emphases on III-nitride metalorganic chemical vapor deposition (MOCVD) growth and nanofabrication
- Excelled in leadership, often seeking team-building and project management opportunities over the past 7 years, which has resulted in numerous leadership awards and recognitions
- Demonstrated clear and effective communication, producing 2 publications and 5+ technical and non-technical presentations
- Developed innovative solutions to complex problems shown through 3 patents and 4 competition awards

Education

- **Ph.D. Candidate in Materials**, University of California, Santa Barbara (UCSB) — **Santa Barbara, CA**
  GPA: 3.82, National Science Foundation Graduate Research Fellow — *2013 – 2018 (expected)*
  Research topic: "Development of III-Nitride μLEDs for Display Applications" — Advisor: Steven P. DenBaars
  Graduate certificate: Technology Management Program
- **B.S. Materials Science & Engineering**, University of Florida — **Gainesville, FL**
  GPA: 3.98 (*summa cum laude*), Minor in Business Administration — *2008 – 2013*

Technical Skills

Experimental: MOCVD growth, scanning electron microscopy, photolithography, electron beam deposition, sputter deposition, dry and wet chemical etching, x-ray diffraction, focused ion beam, LED packaging
Computational: LightTools (ray tracing), SiLENSe (bandgap engineering), MATLAB, Mathematica, Origin, LaTeX
Language: Bilingual in English and Mandarin Chinese

Academic & Industry Experience

- **Graduate Student Researcher** — **Santa Barbara, CA**
  UC Santa Barbara Materials Department — *Sept 2013 – Present*
  - Wrote and grew over 400 MOCVD recipes for p-n diodes, LEDs, and μLEDs on planar sapphire, patterned sapphire, and freestanding c-plane GaN.
  - Developed 5 nanofabrication process flows and lithography mask layouts for flip-chip LEDs, μLEDs, and displays.
  - Modeled LED structures using Monte Carlo ray tracing in Synopsys LightTools software.
  - Trained 5+ incoming graduate students and managed a team to create μLED-based displays by combining MOCVD growth, photoelectrochemical (PEC) etching, and transfer printing.
  - Prepared 2 journal articles, wrote 3 patents, and presented in 5 conferences (national and international).
- **Undergraduate Student Researcher (Summer REU Program)** — **Berkeley, CA**
  UC Berkeley Department of Electrical Engineering and Computer Sciences — *July 2012 – August 2012*
  - Investigated methods to create transistors using electrically-purified, single-chirality carbon nanotubes by doing thin-film deposition and using atomic force microscopy.
  - Fabricated full-color, flexible active-matrix organic light emitting diode (AMOLED) devices.
  - Co-authored 1 publication, presented 1 poster presentation, and 1 oral presentation.
- **Materials Engineer Co-Op** — **Cincinnati, OH**
  General Electric Aviation, Services & Repair Technology Center — *Jan 2011 – May 2011*
  - Conducted jet engine component analysis through non-destructive examination, sectioning, metallographic and SEM evaluation, and documentation for the major engine components.
  - Received a recognition award for launching an investigation and identifying a previously unknown distress mode in a part.
  - Voluntarily completed an After Hours Materials course to learn more about material selection, material processes, alloys, coatings, and failure analysis with respect to jet engine components.

Leadership

- **2015, 2016, & 2017 UCSB Beyond Academia Conferences** **Santa Barbara, CA**
  Co-Chair *Nov 2014 – Present*
  - Oversaw 4 subcommittees (for a total of 30 graduate students and post-doctoral scholars from different departments) to plan a two-day conference for 200 graduate students and post-doctoral scholars.
  - Set a 13 month timeline and organized meetings to track progress and make timely decisions.
  - Raised and managed $23,000 to bring 15+ speakers from all over the US.
- **UCSB Graduate Division and Graduate Students Association Lunch & Learn** **Santa Barbara, CA**
  Co-Founder *Oct 2015 – Present*
  - Came up with the idea for this series that brings together 20-30 graduate students from all parts of campus to listen to two graduate student presentations.
  - Collaborated with the Graduate Division and Graduate Students Association to secure funding and market to all graduate students on campus.
  - Recruited speakers to ensure the event was held monthly since December 2015, which has been recognized as a successful collaboration with the UCSB Library.
- **UCSB Society of Asian Scientists & Engineers** **Santa Barbara, CA**
  Co-Founder and President *August 2014 – June 2016*
  - Organized a group of undergraduate students to create a student organization that develops leaders and serves as a community for science & engineering students.
  - Led the chapter to win the national Outstanding New Chapter Award for the 2015-2016 school year.

Competitions and Awards

- **UC Santa Barbara Grad Slam 2016** **Santa Barbara, CA**
  Finalist and People's Choice Winner; starting field of 80+ graduate students *April 15, 2016*
  - Wrote and delivered a 3 minute speech about current technical research to a lay audience.
- **UC Santa Barbara New Venture Competition 2016** **Santa Barbara, CA**
  Finalist and Cliff Hannel Innovation Award Winner; starting field of 30+ teams *May 19, 2016*
  - Wrote a 10 page business model that included market analysis, findings from consumer surveys, revenue streams, and product development timelines.
  - Crafted and delivered a 15 minute business pitch about a technical product to a panel of entrepreneurs and local business leaders.
- **UF Hall of Fame** (Inducted for outstanding leadership amongst all UF seniors) *March 2012*
- **Tau Beta Pi Florida Alpha Chapter** (Inducted for outstanding leadership amongst all UF seniors) *May 2012*
- **UF Engineering Leadership Circle** (Inducted for being in the top 0.5% of leaders in Engineering) *Dec 2010*

Refereed Journal Publications & Patents

1. C. Wang, **D. Hwang**, Z. Yu, K. Takei, J. Park, T. Chen, B. Ma, and A. Javey, "User-interactive electronic skin for instantaneous pressure visualization," *Nature Materials*, **12** (2013), 899.
2. **D. Hwang**, B. P. Yonkee, B. SaifAddin, R. M. Farrell, S. Nakamura, J. S. Speck, S. P. DenBaars, "Photoelectrochemical liftoff of LEDs grown on freestanding c-plane GaN substrates," *Optics Express*, **24** (2016), 22875.
3. **D. Hwang**, A. Mughal, C. Pynn, S. Nakamura, S. P. DenBaars, "Sustained high external quantum efficiency of III-nitride μLEDs," submitted, December 2016.
4. 1 Patent Pending, 1 PCT Application, and 2 US Provisional Patents (filed between 2015 and 2016)
   Authors: David Hwang, Steven P. DenBaars, James S. Speck, and Shuji Nakamura

Chaired Symposia & Selected Presentations

1. **D. Hwang**, N. Larson, W. Wang (symposium organizers & session chairs), "Transforming the Diversity Landscape" Symposium, 2016 TMS Annual Meeting & Exhibition, Nashville, TN, February 2016.
2. **D. Hwang**, B. P. Yonkee, J. S. Speck, S. Nakamura, S. P. DenBaars, "Development of c-plane thin-film flip-chip LEDs fabricated by photoelectrochemical (PEC) liftoff," CSW 2016, Toyama, Japan, June 2016.
3. **D. Hwang**, A. Mughal, C. Pynn, L. Chan, D. Bothman, J. S. Speck, S. Nakamura, S. P. DenBaars, "Development of III-Nitride μLEDs for Displays," 2016 SSLEEC Annual Review, Santa Barbara, CA, November 2016.