

Nomination packet

Jeannette Yen
Georgia Tech's Center for the Enhancement of Teaching & Learning
Education Partnership Award

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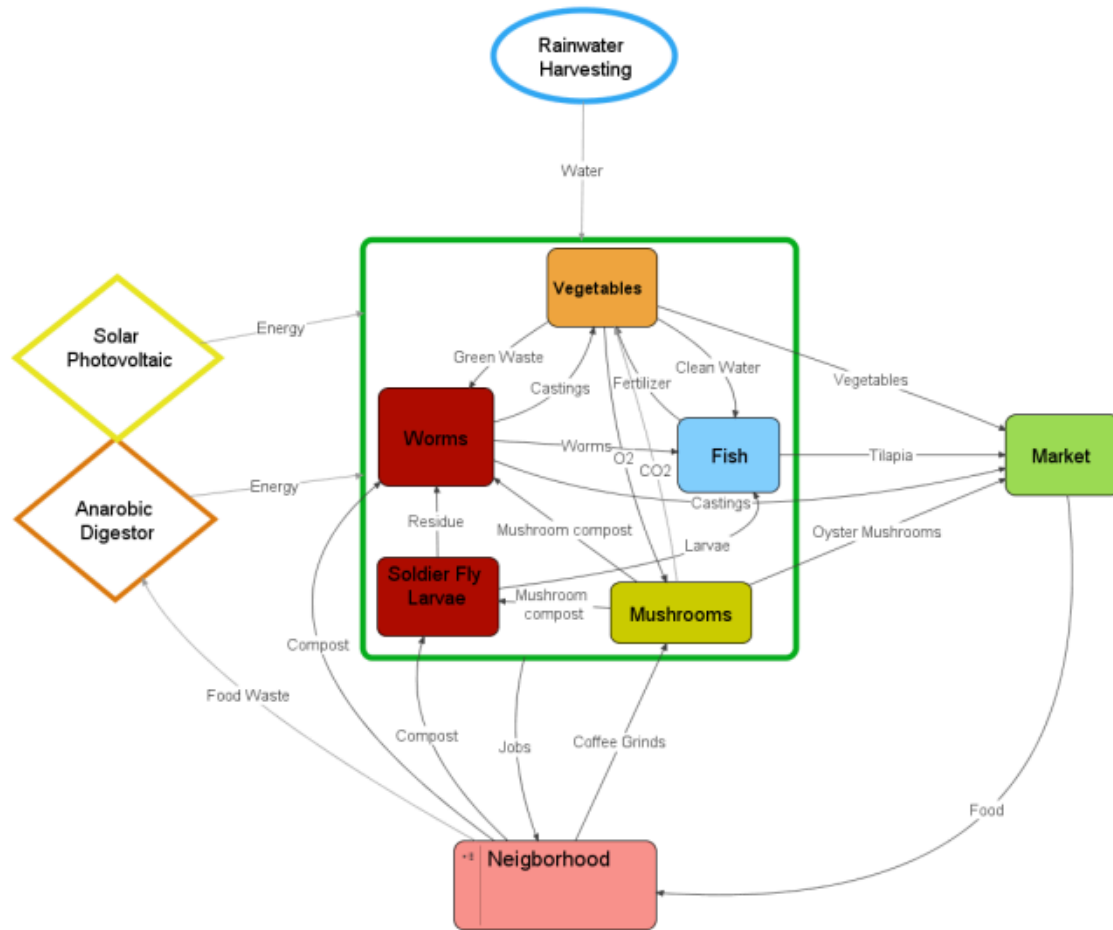
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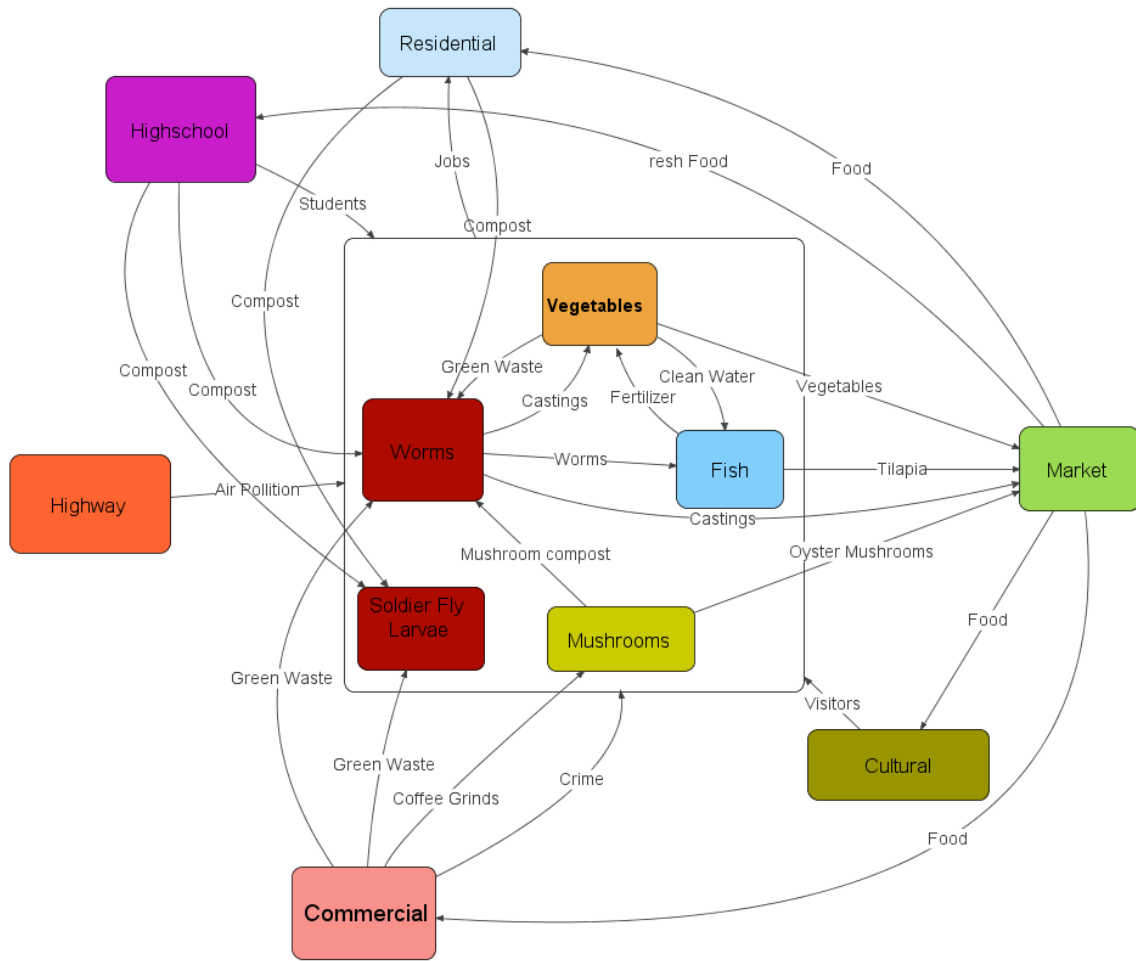
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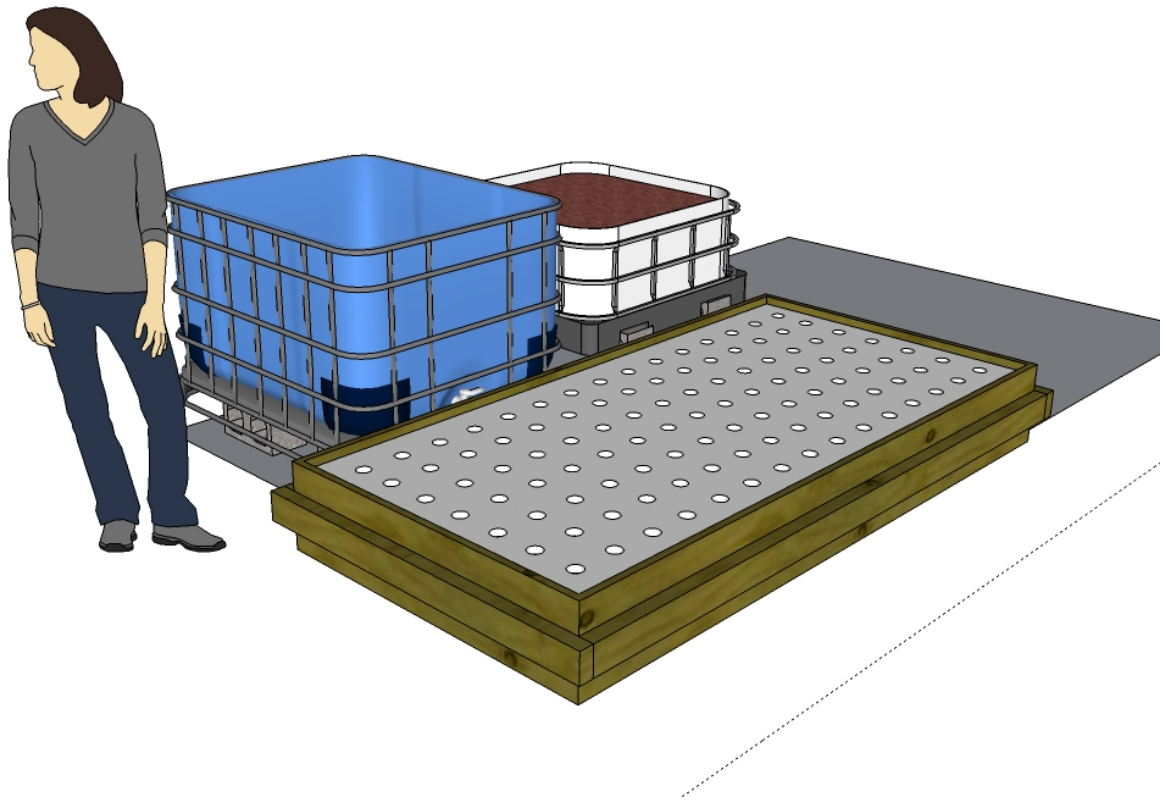
Arkfab detailed conceptual model



Arkfab Model embedded in Old Fourth Ward Neighborhood

DIY aquaponics demonstration

The Arkfab team will be leading a DIY aquaponics demonstration where we will teach participants how to assemble a sustainable system that grows vegetables and fish together. The demonstration system will be built from materials costing under \$300 dollars and using as little energy as possible. Basic system maintenance and aquaponics management skills will also be covered. This demonstration will show anyone who needs access to healthy food how to grow nutrient rich fresh food in high density in the urban environment.





Truly Living Well

Young Grower Training

Program

in Urban Agriculture

Training New Growers To "Transform" Urban Environments

Based in Atlanta, Georgia, Truly Living Well Center for Natural Urban Agriculture (TLW) is re-introducing farming as a viable, socially important occupation. TLW, a 501(c)3 nonprofit organization founded by Rashid Nuri, works to engage communities in developing local food systems through education and food production. The main program components incorporate small scale local food production, economic development and outreach, and education and training. TLW's experiential curriculum enable anyone to learn to grow food using natural, organic and environmentally safe methods. The training programs may be adapted for all ages and audiences.

Sharing our knowledge to teach people to grow their own food is a part of our mission. Having this knowledge is an important aspect of food security and self-sufficiency to help people to eat and truly live well.

Unique Course Format:

- Offers significant face-to-face instruction in classroom and farm environments
- Curriculum is designed to engage all learning styles
- Interaction with master urban agriculturists provides opportunities to capitalize on the breadth of experience to maximize learning opportunities
- Successful completion of the training program enables students to begin urban agriculture gardens, farms or projects.

- Program base is located at TLW premiere urban agricultural demonstration site, Wheat Street Garden located in the Martin Luther King Historic District adjacent to downtown Atlanta.

Basic Training Program Objectives:

The training program will give students the skills necessary to establish and maintain viable, productive agricultural projects. Curriculum based on science, pedagogy and evidence based practices has been incorporated to equip a new generation of farmers with skills and techniques specifically designed for urban application. The Truly Living Well model employs natural and sustainable production methods that deliver high quality food, enhance the environment and improve health.

Program Modules include:

1. Landscape of urban agriculture: Gain understanding in the social and economic demand for urban farming; benefits and challenges of urban agriculture; and various forms of urban agriculture.
2. Soil-Gardening Amendments: Quality of soil is "ground zero" in natural and organic growing practices. Learn key components of composting, soil composition, managing different soil types and increasing nutritional value of soil
3. Plants and Planting: Comprehensive coverage of plant anatomy, plant families, germination and propagation, planting with moon cycles and seasons and more.
4. Integrated Pest and Disease Management: Learn beneficial and dangerous pest, "plant positive" approaches to combating pests and disease.
5. Water and Irrigation: Explore irrigation and efficient watering techniques, and rainwater catchment and drip irrigation systems.
6. Harvesting: Learn best practices in harvesting methods and seed saving.
7. Garden Planning and Management: Gain knowledge in permaculture planning concepts, sunlight and water access, most useful tools and garden structures and plant selection
8. Eat and Live Well: Discuss healthy food choices and food preparation, benefits of eating natural and local food; and ways to connect people with their food and the land through the local food movement.
9. Green House Science: Engage in a fun building project to construct a greenhouse or hoop house.
10. Making This Your Own: Urban agriculture is one of the nation's newest and exciting career paths. Explore ways to apply knowledge gained to create opportunities for self-sustainability, employment and entrepreneurship in urban agriculture. Discover niche jobs or unique ways to find land, negotiate for sustainability, and grow your own business.



The Kindezi School Garden Program Report

Characteristics and program features:

The Kindezi school is a charter school in northwest Atlanta serving 161 students. The school has a unique philosophy which employs an unusually small student/teacher ratio of 6 or 7 to 1. Each classroom contains a pairing, so that two teachers and their respective students have opportunities to interact and work together, sharing ideas and responsibilities on an ongoing basis.

Several planning meetings took place in the fall of 2012 between all parties, including the Greening Youth Foundation, the Kindezi School and Truly Living Well Center for Natural Urban Agriculture. Truly Living Well provided the raw materials for the beds, and labor, as well as weekly instruction for the students and teachers. Amakiasu Ford-Howze taught garden lessons from February through May of 2013. Lesson topics rotated in three-week cycles, covering four classes and two grade levels per week.

Ten raised beds were installed in December of 2012, however, they were not planted until early March of 2013 due to an unusually long and cold winter. Five of these beds are located on the outside of the school, close to the rear entrance, while the other five are in a large courtyard, which boasts an amphi-theatre and stage.

In January, one of Kindezi's classroom teachers, Melvin Bray, transitioned to become garden support staff, which included the supervision of the after school gardening club, as well as several projects, including an entrepreneurial micro greens initiative, school-wide composting, and the implementation of a vermi-culture system.

A culminating Garden Extravaganza was held on May 9th to celebrate the garden. Over 85 families were in attendance and this include approximately 120 children, with a total of about 225 people.

Program goals and objectives were as follows:

1. To introduce students and teachers to the process of school gardening
2. To install a garden appropriate and useful for the Kindezi school.
3. To support teachers who chose the garden as the focus of their project based learning module.*
4. To enlist community support for and engagement in the garden
5. To hold an end-of-the-year school wide event celebrating the garden

* Project-based learning, is a dynamic approach to teaching in which students explore real-world problems and challenges, simultaneously developing cross-curriculum skills while working in small collaborative groups.

Garden/Program Outcomes

1. Ten raised beds and two pollinator gardens were installed.
2. Twelve pots of various sizes were painted and planted by students.
3. Each of 161 students received four garden lessons.
4. All students received garden lessons first-hand through direct experience.



**Georgia Institute
of Technology**



Center for Biologically-Inspired Design

A research and development team translating nature's ecosystems - her organisms, materials, methods, and sensory behavior - into sustainable models for the future

To: Center for the Enhancement of Teaching & Learning

From: Jeannette Yen, Ph.D.

Professor, School of Biology

Director, Center for Biologically Inspired Design

Georgia Institute of Technology

Atlanta, GA 30332-0230

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404-385-1596; 404-894-0519 fax

<http://www.biology.gatech.edu/professors/yen.html>

<http://www.cbid.gatech.edu/>

Subject: Education Partnership statement

Over the past four years, I have led an urban agriculture project, ArkFab, whose goal is to strengthen the links between academia and our local community. Using capacities developed by the Georgia Tech Research Institute and the Truly Living Well Center for Natural Urban Agriculture, our interdisciplinary team has contributed to sustainable economic development in Georgia by training farmers on the use of renewable energy technologies on urban farms. This program will make Georgia farms more competitive and responsive to an increasingly unpredictable energy market. This unique competitive advantage will enable Georgia farms to retain and hire more employees creating further economic opportunities for urban communities.

My contribution has primarily been in the arena of raising funds and identifying the students and community members with the expertise we needed to make this endeavor successful. This process has opened up a HUGE door into a topic that has enriched my life in so many ways. Not only do I have a chance to continue interacting with GT students, I now have a fascinating connection to the local community of urban food growers. What a diverse and dedicated group of forward thinkers! Truly Living Well runs these active K-12 programs [pls see examples of 2 of them attached to main proposal] where ArkFab serves as a model for a closed loop system, a flow chart that at first seems complicated to them but when the kids see the fish, and consider how they fertilize the water, then taste the vegetables that have been growing in the water and test the water quality after passing through the grow beds, they start thinking differently. They know about traditional farms and learn about fresh food but our ArkFab installation is unique. They go away asking their parents if they can set up in their backyard and Justin Chaddick, my student leader, has taught his 1 day workshop on DIY aquaponics.



I am learning so much about life in the big city, how to make it closer to living in nature, how to live and eat more healthily, how to engage with community leaders in this area. It also has introduced me to local environmental leaders and has given me a sense of empowerment that perhaps, I really can have an impact and save some part of this amazing planet Earth. I have strongly believed that diversity is achieved not only in ethnicity and gender, but also in discipline, economic and education level, age, and cultural background; ArkFab is fulfilling that vision.

We have garnered the attention of our local community and they are providing support. The FORD Foundation grant got us off the ground in 2011. These initial efforts were supported by the Ford College to Community grant. For this funding, 3 community groups provided letters of support: Georgia Organics, Truly Living Well, and Center for Innovation in Agribusiness. We are now in our second phase of funding from the PNC Bank. We received funding from Procter and Gamble. We received a generous donation from a high standing member of our community. And we have caught the eye of Georgia Tech's development office that informs us of opportunities for additional funding: just last week, we answered John Deere's request for proposals that support feeding the underserved. I hope we get that needed John Deere tractor to move all the rich soil that those industrious earthworms are making from compost. Waste is food! These proposals request funds to scale-up, using the Wheat Street **ArkFab** as the model to be replicated by other organizations [potentially interested entities include Georgia Tech's EcoCommons, Morehouse College, and the Atlanta BeltLine]. The goal is to encourage and support the community to expand this food network within and beyond the city limits of Atlanta.

Hence, in addition to my own sense of accomplishment in my area of biological oceanography and underwater communication, I now can confidently claim I have expertise in urban agriculture. Never in my wildest dreams would I have thought something like this could happen to me, though I do remember Dad asking *why don't I work on something we can eat* [I work on plankton!]. I am so lucky. With the additional funding and stronger ties we are building, I look forward with excitement to learn and do more.

Thank you for the opportunity to express my gratitude for the benefits I have gained from this partnership.



March 4, 2015

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Molden Holley

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To Whom It May Concern:

Truly Living Well's partnership with Georgia Tech via the leadership of Dr. Jeannette Yen, has provided outstanding support for two of our K-12 STEM programs: The Kindezi Project and the Young Grower's Program. TLW uses urban agriculture to demonstrate the use of STEM in real life situations. The results include reinforcement of academic principles, exposure and interest in related agricultural and STEM careers, important connections to local food systems and healthy food sources, and better environmental stewards.

The opportunity to demonstrate Dr. Yen and her team's aquaponics system has evoked tremendous curiosity and excitement in our young students. This unique system has given our young students the chance to see fish fertilizing water and eat the plants that have been nourished by this natural fertilizer and learn how plants can clean water. Some of them never thought something like this could work in a city and it fills them with wonder. We're working with them to make the connection between these alternative systems and sustainability for food sources, healthy environments and their future.

Truly Living Well and Dr. Yen have been successfully working together for over 3 years now. We have created an excellent foundation to impact youth and others in our community for years to come.

Thank you for your attention and time.

With warmest regards,

Chief Development and Program Services Officer

cc: Rashid Nuri, Chief Executive Officer



The Kindezi School

An Atlanta Public Charter School

February 19th, 2015

To Whom It May Concern:

The Truly Living Well Center has worked with Kindezi on a number of projects in the past. We are truly excited about partnering with Truly Living Well Center for Natural Urban Agriculture's application to expand its composting system project to further support the local food movement of the City of Atlanta by working with the future citizens of the Old Fourth Ward, who are our students. We anticipate that you will support this endeavor by funding this composting project, which will lay a strong foundation for cultivating a community of urban farmers.

Sincerely,

Mrs. Gilberte Pascal

Mrs. Gilberte Pascal
Founding Principal of Kindezi Old Fourth Ward
404-671-4900

To: Center for the Enhancement of Teaching & Learning

From: Justin Chaddick, Georgia Tech graduate student

Subject: Education Partnership with Professor Jeannette Yen

Over the past 4 years, I have been involved in the design, construction, and execution of an urban agriculture project entitled ArkFab as the team coordinator and lead researcher. I believe academia should use its resources to solve real local community problems and ArkFab presents a model that I have been envisioning for some years of my recent life. ArkFab is a design for regenerative and sustainable systems constructed in my hometown, Atlanta, GA. The mission of ArkFab has been to build a resilient local food system in Atlanta by supporting collaborative projects between urban farms, the surrounding community, and the university system. The key to resilience is diversity and connectivity. A resilient food system draws from a diverse set of locally abundant resources (human and material) and employs multiple avenues for deriving value from those resources. We strive to unify a diverse range of perspectives and skill sets to address the complex challenges of urban agriculture, including food access, education, and waste management. We encourage solutions that capitalize on the abundance of energy and nutrients, freely available in Atlanta's waste streams. Our approach, developed at our Center for Biologically Inspired Design, directed by Dr. Yen, asks: how does nature cycle energy and nutrients efficiently and how can we emulate those design principles to grow food efficiently? To this end, we have been developing a system to upcycle urban food waste into sustainable fish food. The main project we have been working on is an aquaponics system that symbiotically combines recirculating aquaculture with hydroponics, using 90% less water than conventional agriculture and no synthetic fertilizers or pesticides.

One of the main hurdles to creating a fully sustainable aquaponics system is generating a sustainable fish feed, as conventional fish feed is "mined" from the ocean's fisheries. Therefore, creating a fish feed grown from Atlanta's abundant food waste is the topic of my current effort for my master's of science at the School of Biology of Georgia Tech. ArkFab has provided me a platform to test the feasibility of new innovations, which then have a chance to be carried out in the field, meet real human needs, gain exposure, and generate feedback between the academic and farming communities. We believe that opening this channel will spark interest in urban agriculture among GA Tech students, connect the innovative capacity of Ga Tech with community needs, and make STEM more accessible to young urban growers.

Working with ArkFab, the Center for Biologically inspired Design, and Truly Living Well has taught me what it takes to be a leader and how to tackle challenges of collaborating across institutions for a common goal. This experience has been invaluable to me. Also, giving in depth tours of the ArkFab system to a diverse array of students from elementary to collegiate level has greatly broadened my communication skills and strengthened my ability to break down higher-level concepts to all age and education groups.



Dr. Terry W. Snell
Professor and Chair
School of Biology
Atlanta, Georgia 30332-0230 USA
Phone: (404) 894-8906
Email: terry.snell@biology.gatech.edu

March 5, 2015

To whom it may concern:

I write to nominate Professor Jeannette Yen for the CETL Educational Partnership award. Jeannette has for many years taken the lead in advancing education and research in biologically-inspired design [BID] at Georgia Tech. BID is an innovative tool, utilizing design strategies observed in natural systems as stimuli for novel inventions. As Director of the Center for Biologically Inspired Design, she has promoted BID courses, seminar programs, helped host an international conference at Georgia Tech, and lectured to a variety of professional groups.

Jeannette is lead instructor for Biol/ME/MSE/PTFE/ISyE 4740, interdisciplinary class on BID that combines biology, engineering, and design. It is a team- and project-based course where students learn critical biological and engineering principles to produce conceptual designs of bio-inspired solutions for real-world problems. Students in this class have gone on to do advanced BID research projects and participate in industrial internships.

Jeannette leads a project (Ford College Community Challenge Grant) to develop a model for intensive urban agriculture that reduces food production costs, increases food security, and provides healthy food for low income communities - serving as a Living Laboratory for undergraduate research projects. This project is centered at the Truly living Well garden in downtown Atlanta and has served as a venue for service learning projects in our sophomore ecology class this past Fall. Also on this site, Jeannette has led a research effort in aquaponics called ArkFab. This project is the focus of at least one masters thesis and has laid the foundation for other graduate students using this facility in their research.

In summary, Dr. Jeannette Yen is a pioneer in the development of a novel interdisciplinary education and outreach. She has consistently involved local communities and advanced their needs as educational and research activities were conducted. Her work and that of her colleagues that she has recruited to this effort is having profound impact on the research and educational activities of faculty and students across Georgia Tech and the communities that we serve. She is highly deserving of the CETL Educational Partnership award, and I commend her to you with the strongest possible enthusiasm.

Sincerely,

A handwritten signature in black ink that reads 'Terry W. Snell'.

Terry W. Snell
Professor and Chair

Zimbra**jy46@mail.gatech.edu**

CETL Educational Partnership letter of support

From : Chrissy Spencer
<chrissy.spencer@biology.gatech.edu>

Thu, Mar 05, 2015 08:08 AM

 1 attachment

Subject : CETL Educational Partnership letter of support

To : Jeannette Yen
<jeannette.yen@biology.gatech.edu>

I endorse Dr. Yen's application for the Education Partnership award, and I approve the transfer of my letter of support dated January 26. Her work to support graduate student Justin Chaddick and their efforts at community and school outreach at ArkFab and Truly living well deserves this recognition.

Best,
Chrissy

--

Chrissy Spencer, PhD
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310 Ferst Drive
Atlanta, GA 30332

office 404 385 0539
fax 404 894 0519
chrissy.spencer@biology.gatech.edu

**4_Yen, Jeannette - Spencer support letter.pdf**836 KB

March 4, 2015

Ms. Esther Jordan
Assistant Director for Programming
Center for the Enhancement of Teaching and Learning
Georgia Institute of Technology

Ms. Jordan,

Please accept my endorsement for Professor Jeannette Yen's application for the Education Partnership award, as stated in my letter of support dated January 31, 2015.

I believe this recognition is well-deserved.

Sincerely,



Steve W. Chaddick

EE '74, MSEE '82

Chair, School of ECE Advisory Board
Immediate Past Chair, Georgia Tech Alumni Association
Vice-Chair and Chair-Elect, Board of Trustees, The Galloway School

Zimbra**jy46@mail.gatech.edu**

Endorsement of Dr. Yen

From : K. Rashid Nuri <admin@trulylivingwell.com> Thu, Mar 05, 2015 10:28 AM**Subject :** Endorsement of Dr. Yen**To :** Jeannette Yen
<jeannette.yen@biology.gatech.edu>**Reply To :** K. Rashid Nuri <admin@trulylivingwell.com>

Greetings,

I would like to endorse Dr. Yen's application for the Education Partnership Award, as stated in my letter of support dated Feb. 2, 2015. She deserves this recognition!

Thank you for your time and consideration.

K. Rashid Nuri

Truly Living Well

P.O. Box 90841

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Phone: 404 520 8331

VISIT OUR WEBSITE:www.trulylivingwell.com

It is simply service that measures success. - George Washington Carver



Center for Biologically-Inspired Design

A research and development team translating nature's ecosystems - her organisms, materials, methods, and sensory behavior - into sustainable models for the future

From: Jeannette Yen, Ph.D.
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<http://www.cbid.gatech.edu/>

A handwritten signature in purple ink that reads "Jeannette Yen".

Subject: Letter of support to **Justin Chaddick** from Prof. J. Yen, his graduate advisor

I am the Director of the Center for Biologically Inspired Design at Georgia Tech. As a professor in the School of Biology at GaTech, I teach an interdisciplinary undergraduate course on this topic that Justin Chaddick took in 2010, which is where we discovered each other. In the years since, I have been on an incredible journey, witnessing the growth in focus, depth of knowledge, and forward thinking of Mr. Chaddick. And, in my opinion, this is just the tip of the iceberg: I expect we are going to see a lot from this young man. After taking my course, he did internships with GT faculty and changed his major from materials science to environmental science. Then in the summer of 2011, he asked if I had any projects in urban agriculture. This was exactly the time when I needed him. Liam Rattray, the brilliant student, graduating at the top of his class of 2011 at GT, had just been killed by a drunk driver and the proposal he had written to the Ford Foundation on urban agriculture just got funded. I just don't know how such tragedy and salvation can co-occur. I can only grow from the experience. And we have.

The goal of this Ford College-to-Community grant is to strengthen the links between academia and our local community. For this, we focused our efforts on urban agriculture. Urban farms across the country are seen as leaders in sustainability and are prominent icons of environmental stewardship. Justin has built many ties with the urban farmers throughout Atlanta, and is well-versed in many ways to implement sustainable practices. I am learning so much from him. We now have a successful link between Georgia Tech and Truly Living Well to provide fresh produce for the local underserved community of the Fourth Ward of Atlanta while simultaneously offering demonstrations and educational opportunities related to urban farming and renewable energy. We now have a nearly operational closed loop aquaponics system. We are able to support community workers, capstone design teams and ecology project labs at ArkFab, a living systems laboratory for interdisciplinary projects. Justin himself is doing his master's of science in the School of Biology on developing a non-commercial non-GMO fish feed by recycling compost. Ingenious!

I look on with awe as I listen to Justin describe his vision to build an incredible collective for our city, to openly share the new knowledge so that so many more people would benefit.
Look out world.