



Issue 5: February 2022



The Monthly Newsletter of the InnovateFPGA Design Contest

We invite you join the InnovateFPGA community to see the amazing projects developed based on Intel's Edge-centric FPGAs

[Join the community today!](#)

Team projects will focus on the sustainability theme and deliver benefits to environmental issues such as water conservation, optimizing energy usage, limiting waste, and making intelligent use of the planet's resources.

If this seems interesting to you, go to [InnovateFPGA.com](#) now to sign up as a community member and engage with the contest teams!



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Ideas for Improving Sustainable Farming

By Tom Schulte

Agriculture began approximately 9000 BCE when the people in the Mesopotamia region started breeding naturally occurring plants to make them more edible for humans. Eventually, saving seeds from one harvest to the next helped to create domestic strains of food. Advances in various technologies (water distribution, fertilizers, tools for planting/harvesting, etc.) have contributed greatly to the expansion of farming into a global industry. One of the recent trends/topics in farming is finding ways to make it more 'sustainable' while also maintaining efficiency and cost effectiveness.

Many design contest teams are working on projects that focus on

the Smart Agriculture category, and as a result there have been some interesting and innovative ideas. One of the interesting Smart Agriculture themes is to use new technology to use water more efficiently in farming.

One team from the APJ region is working on a portable device, which includes sensors and a camera wirelessly linked to a smart phone. The camera could be used for detection of moving objects (such as rodents, insects, or grazing animals) or detecting plant diseases. The sensors would measure rainfall, soil moisture, or soil chemical composition. Other teams are also working on methods to make similar sensors mobile, and are using semi-autonomous robots to ensure the sensors are located correctly.



Digital technology could play a key role in scaling up local solutions led by civil society and local communities to address the climate crisis and biodiversity loss in developing countries. This collaboration between the GEF Small Grants Programme (SGP), Intel and Microsoft is an excellent opportunity to design and apply innovative and scalable digital solutions to real world problems, and help local communities to improve and expand their initiatives, ranging from climate smart agriculture to wildlife management.

– Yoko Watanabe, Global Manager, GEF Small Grants Programme

Watch this ADI video to see how a large variety of ADI daughtercards can be plugged into the FPGA Cloud Connectivity Kit.

<https://www.youtube.com/watch?v=ft-SWOKmxNs>



In the contest, the teams will be asked to justify the choices they made and to demonstrate the sustainability credentials of their project. In the case of the Smart Agriculture projects, what is the right amount of technology or automation for the application? What are the benefits or weakness of the proposed modes of operation for these three products.

- Portable device
- Ground-based robot
- Drone-based robot

The portable device has to be manually moved / inserted in various spots around the farm. While this allows the price of the tool to be low and more reliable (due to minimal or no moving parts), it would probably only be suitable for small sized farms but probably not for medium to large farms.

The ground-based and drone-based robots provide a more mobile solution, enabling them to cover/inspect large areas of the farm with minimal manual effort. Off-setting this benefit would be the higher cost, larger size,

and long-term reliability of the more complex platform.

Another related topic to compare and contrast these 3 choices would be focused on the energy source necessary to power these smart products. The portable device would operate at much lower power levels, thus needing less frequent re-charging... possibly even renewed by passive solar panel like materials mounted directly on the tool. The larger robots would consume significantly more power, requiring more frequent and larger density recharging equipment. These choices for energy sourcing/recharging need to be factored into the cost calculations/ROI.

Regardless of some of these business & operational considerations, the technology to enable them is available now. It will be interesting to see how the teams are able to integrate the different technology pieces together into a usable Proof of Concept that can be shown to have a benefit to how we use the planets resources.



Terasic is dedicated in providing engineers of the future the opportunities to share their visions and innovations and demonstrate their FPGA development skills on an international stage.

Continued from the success we had with previous InnovateAsia design contests, where we see many innovative inventions, there should be no doubt that we will see more brilliant works from 2021 InnovateFPGA Design Contest.

—Sean Peng, CEO of Terasic.

Professional Support

Contest organizer Terasic will answer questions and provide technical support for contestants / developers. Stay tuned for more 'how to' details in upcoming newsletters. Go to URL to submit questions:

<https://www.innovatefpga.com/portal/support.html>



Key Dates

Develop Designs Oct. 16, 2021 – April. 3, 2022

Selected teams will develop the projects using provided resources and upload completed design paper and project video before the deadline, April 3. Teams who advance to the regional finals will be announced on April 11 on InnovateFPGA website.

Terasic, Intel, Microsoft, Analog Devices have developed a complete set of technical resources, getting started documents & videos for the contest platforms. Contestants can utilize the resource available on InnovateFPGA Support Page during the development.

FPGA Cloud Connectivity Kit:

- [Terasic Getting Started Resources for FPGA Cloud Connectivity Kit](#)
- [Intel Developer Zone Resources for DE10-Nano](#)
- [Intel Developer Zone Getting Started Articles for FPGA Cloud Connectivity Kit](#)

Microsoft Azure IoT:

- [Watch a video from Microsoft showing how to get started with Azure IoT](#)
- [GitHub Resources for Azure IoT and the FPGA Cloud Connectivity Kit](#)

Analog Devices Plug-in Boards:

- [EngineerZone support for questions related to ADI Plug-in Boards](#)
- [Overview and Reference Materials of ADI Boards for InnovateFPGA Contest](#)

Regional Finals April. 22, 2022

The Judging Committee will select 1 winner and 2 runners-up in each region based on teams' design papers, video presentations, and the online live Q&A sessions held on April 22. For details of the online regional finals, please refer to: [Regional Final Announcement](#)

Grand Final June. 23, 2022

The top 3 teams from each of the Regional Finals will be invited to present and demonstrate their projects to the judging committee, consisting of industry experts in San Jose, CA.

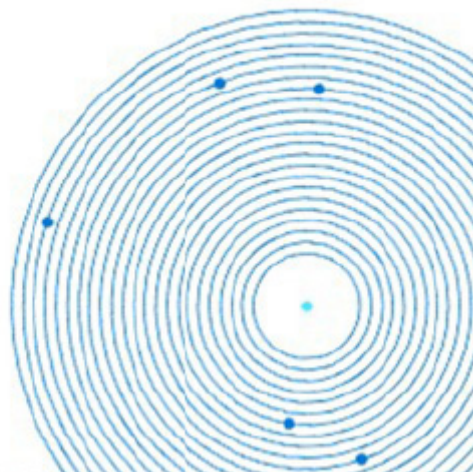
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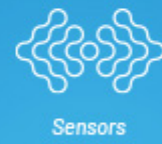
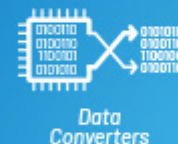
 [Learn more](#)



**“ADI and Intel
share a vision
for how world
changing
technology can
enrich the lives of
every person on the
planet. There is enormous
potential for our technologies
to improve the way people live
and to reduce our impact on
the planet, and we’re proud to
support the engineers of the
future as they pursue this
work in InnovateFPGA.”**



Anelise Sacks
*Senior VP, Chief Customer Officer
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