



**iDEA**lab

Fostering students'  
entrepreneurship and  
open innovation in  
university-industry  
collaboration

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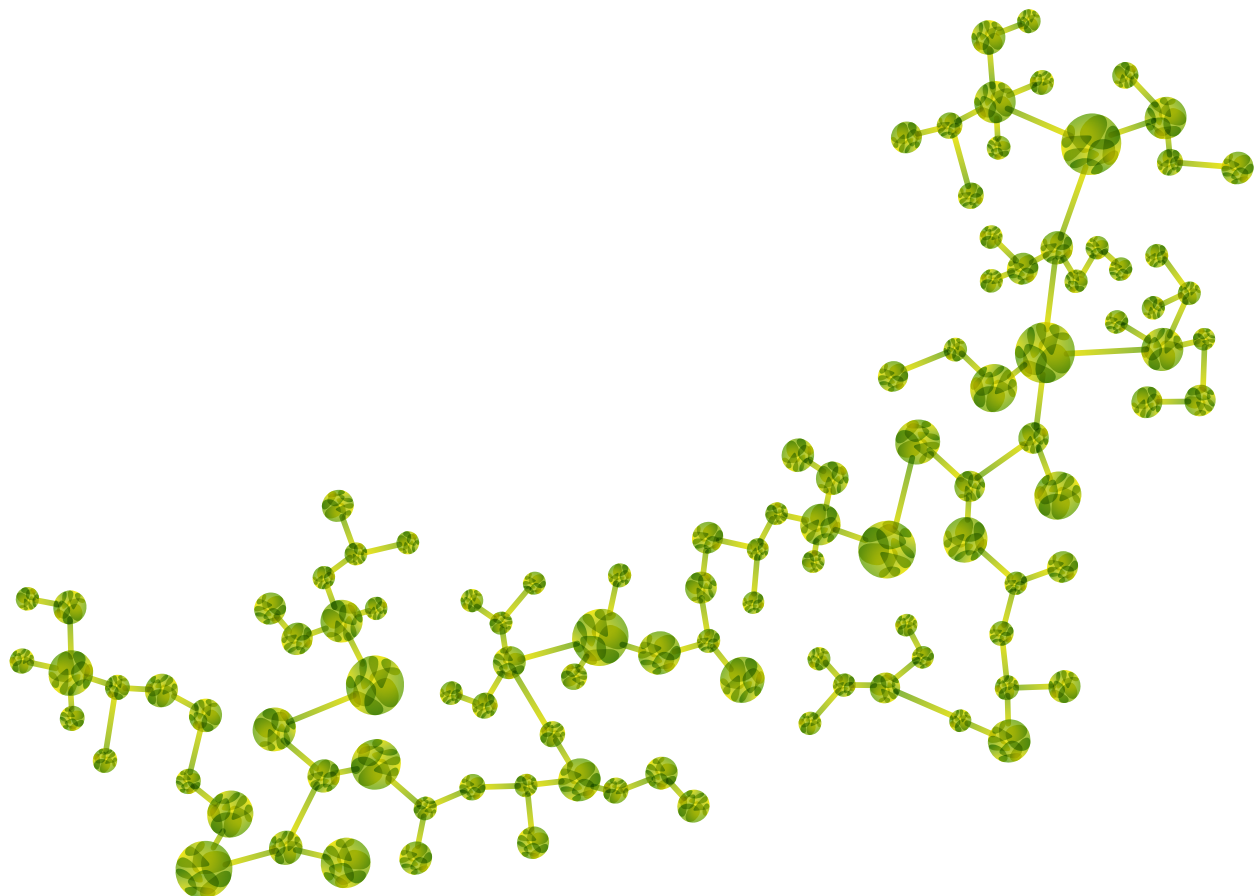


# Intro

The Tempus project “Fostering students’ entrepreneurship and open innovation in university-industry collaboration - iDEALab” (Ref. No. 544373-2013) aims to develop six iDEALabs in Western Balkan countries (WBC) in order to foster the collaboration between higher education institutions (HEIs) and enterprises, advance employment potential of graduates and enhance companies’ innovativeness.

Project aims to develop iDEALab as a physical and virtual environment for generating, developing and commercializing innovative students’ ideas through relevant trainings, mentoring and technology put at their disposal, following the entrepreneurial or open innovation pathway.

Development of iDEALab model is based on exploration of best practice from EU regarding living labs, idea incubators, and business accelerators and detailed analyses of local entrepreneurial and industrial needs for trainings and services in WBC.



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<sup>1</sup> This white paper is mostly based on the following papers [7], [16], [21].

## The Problem

Evidence from several studies [1]–[4] show common problems related to students' entrepreneurship at HEIs in Bosnia and Herzegovina, Montenegro and Serbia:

- The youth unemployment rate is twice higher than the unemployment rate for the whole working population, approaching 50% across WBC. Graduates are not in much better situation than the rest of young population.
- Only a small percentage of young people in WBC get practical experience while studying. Even smaller percentage is ready to start own business after graduation.
- High majority of students admit that they are getting knowledge and acquire skills during studies that are only useful to the public sector or very big enterprises.
- Education and training in entrepreneurship in WBC is academically driven, while the interested students are market and practice oriented.
- Entrepreneurship is dominantly thought at business and economic departments, rarely to engineering students
- Students understand well that the market in each of the WBC is very small to reach an adequate size of a market niche necessary for start-ups. They are aware of the necessity to network throughout the Balkans.
- Students' business ideas are mostly related to ICT and mobile phone applications, media and entertainment content. They are much more software and service oriented, than product and manufacturing.
- Student's start-ups are much easier to establish with a systematic guidance in creativity and idea generation than with scientific support on the technical side, such as business planning which is taking precedence.
- There is little if any knowledge about financial instruments of the equity and participation types.
- Advertisement of good local practices and successful stories seem to foster entrepreneurship, while successful stories from highly developed countries seem to lead to the opposite results.
- Incubators, especially virtual, make the entrance easy to the interested students; if it is twinned with business education, it becomes successful, while allowing learning by doing as an efficient method.

Additionally, the research showed that majority of students had thought about starting up their own business during studies, but changed their mind, from being employer to being employed, because the lack of support (space, mentorship, risk reduction) to try it.

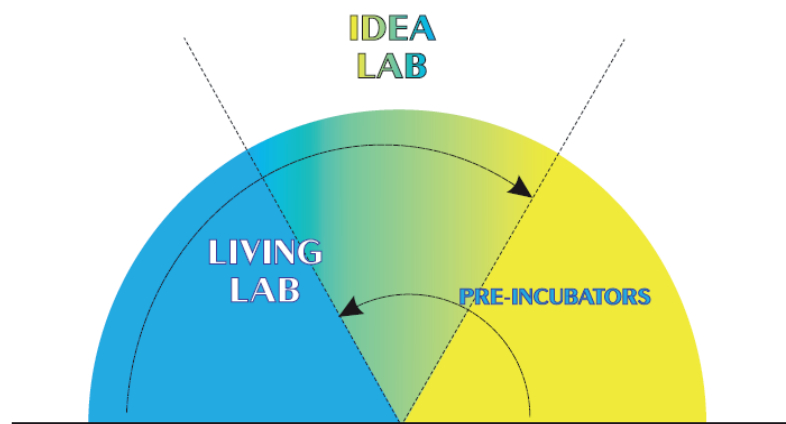
This situation is amplified by very low level of university – industry collaboration in WBC [1], [5], [6] which prevents students from getting real world experience through problem-based learning and hands on experience in the workplace. These are some of the most important insights:

- The employment of graduated students without any practical experience causes high costs for the companies, because they have to introduce them to every single process.
- Innovativeness of companies from WBC is very low comparing to companies from EU.
- Open innovation concept is underdeveloped in WBC and thus many resources unused.

# Inspiration

The idea is rooted in an experimental ecosystem called Media Centre that was operational at the University of Novi Sad between 2004 and 2008. The Centre offered students' an opportunity to use small room with several computers, some video recording equipment and fast internet connection without restrictions. Approximately 30 students took part in activities of the Centre during four years. As a result, students who were engaged with the centre developed several companies and found an easy employment. However, this ad-hoc initiative ended because of the lack of systematic support (trained staff, developed services, bigger space) from the Faculty side [7].

On the other hand, the inspiration comes from successful examples of living labs and pre-incubators.



**Living labs** can be defined as physical regions, virtual reality, or interaction spaces, in which stakeholders form public-private-people partnerships (4Ps) of companies, public agencies, universities, users, and other stakeholders, all collaborating for creation, prototyping, validating, and testing of new technologies, services, products, and systems in real-life contexts. They provide structure and governance to participation in the innovation process and engage co-creators as explorers of emerging ideas, breakthrough scenarios, and innovative concepts [8], [9].

**Pre-incubators** are a modern, for-profit type of start-up incubators. Unlike traditional business incubators, in which companies can share offices for years, pre-incubators are structured like boot camps designed to turn tentative ideas into prototypes or market-ready products in several months, putting small groups of entrepreneurs through intensive training and mentorship. They rely on three main stakeholders: start-up teams, investors and mentors; the absence of any single one of these stakeholders arguably makes it impossible for a pre-incubator to function [10].

## Best practice examples

Innovation and entrepreneurship labs recently established at some of the world most recognized engineering schools can serve as good practical examples how to enhance students' creativity. The following five cases are especially interesting.

**Student Inc.** at the Royal Institute of Technology (KTH, Stockholm, Sweden) is a student run business incubator for students. It is the result of partnership between Excitera, a student non-profit entrepreneurship organization, and KTH Innovation. Student Inc. supports technology based projects with promising commercial potential of students at KTH, who have developed their novel ideas together with KTH Innovation. When they make a certain progress, they can apply for a place at Student Inc. to get the necessary facility (working space) and mentorship support to commercialize their project [11].

**Harvard Innovation Lab (i-lab)** established at Harvard University (USA) helps students interested in entrepreneurship and innovation to grow their ventures, fostering creativity, cross-disciplinary and cross-university collaboration. It is student centred and faculty enabled, and operates as a start-up within the larger university environment. It combines foundational learning on innovation and entrepreneurship with expert resources for students to apply to their ideas, and offers experiential learning experiences and venture incubation program [12].

**Innovation and Entrepreneurship Lab (ieLab)** at ETH (Zurich, Switzerland) offers an innovative environment to support the technology development and its faster commercialization, bringing together students and researchers from ETH, talented young entrepreneurs, experienced businessmen and industry partners. Talented students with the interest in entrepreneurship are offered with supervision and encouragement of experienced coaches, necessary workspace, networking with their young colleagues, successful entrepreneurs and industrial leaders. ieLab represents an ecosystem where a process for accelerated technology transfer from science to business happens [13].

**International Innovation Labs** were organized in order to bridge the gap between universities and SMEs to stimulate business innovation. In this case international student teams from three universities (Belgium, Finland and Latvia) were formed to come up with creative solutions for genuine business problems posted by the SMEs. Innovations were focused on online communication strategies and new markets approaches [14]. Ten SMEs involved in the project were generally very satisfied about their participation with mostly a score of 8/10.

Since the academic year 2007-2008, each winter semester first-year bachelor students are involved in an open innovation contest in the class "Basics of e-Business" in the **School of Business and Economics of the University of Erlangen-Nurnberg** in Germany. This contest is set up on IDEANET open web-based platform for crowdsourcing, developed by HYVE AG. In the winter semester of 2009-2010 students had a task to create and submit business concepts for service innovations based on smart phones in the context of leisure and entertainment, fitness and healthcare, or education. Working in teams, 1198 students developed 265 concepts during six weeks [15].

iDEALab - CONCEPTUAL MODEL

# iDEALab - conceptual model

The core idea behind iDEALab is to provoke, stimulate and motivate students and young researchers to actively use their intellectual and creative potentials to generate innovative ideas, which are product or service oriented. It is conceived as an open lab that accepts any student from any faculty inside university, fostering cross-disciplinary and cross-university collaboration [7], [16].

In the heart of iDEALab model is a co-creative and multi-disciplinary network that serves as:

- A platform for generating, developing and commercializing innovative ideas through entrepreneurial pathway (start-ups) or in collaboration with companies (open innovation)
- A unique environment of experiential learning for students at large
- A unique value proposition for working with industry and institutional partners
- A means for re-engaging with the community

The basic aim is to develop a physical and virtual environment supportive for generating and developing innovative students' ideas through relevant trainings, mentoring and technology put at their disposal. However, the higher goal is to assist students in creating and developing their entrepreneurial intentions by helping them to realize their creative ideas and by providing them safe and functional environment as well as logistical, informational and operational help.

Besides serving as a cross-disciplinary and multi-stakeholder platform for entrepreneurship, collaboration with industry, innovation and commercialization, iDEALab will offer a unique environment for problem- and work-based learning and improve educational experience for students and prepare them for active role at labor market. Additionally, iDEALab will be partly included in the teaching process. This will enable not only entrepreneurially oriented students, but students at large to become an integral part of new product and service development, as well as new venture creation, and thus get chance to enhance their own employability [16].

iDEALab environment will provide full hardware and software, training, mentoring and networking support for the growth of students' ideas. These resources and supportive environment should substantially increase the likelihood for exploration of creative potentials and creation of innovative solutions [7].

## Two pathways of iDEALab

Students' entrepreneurship is getting more and more attention and support from policy makers and university leaders across the world after the publication of the document titled "Rethinking Education strategy" by the European Commission [17], which emphasizes that "all young people should benefit from at least one practical entrepreneurial experience before leaving compulsory education". The topic has a significant influence on the economic development, on the increase of employment rates, its effects on structural changes, as well as on the introduction of innovation and creation of social wealth [18].

The challenge for entrepreneurship education is to create an inspirational effect and make it interact with the creative potential and knowledge network available. Therefore, it is important to design and introduce new educational programs and trainings in the fields of entrepreneurship. The issue here is that it has to become a policy instrument to make more people aware of the entrepreneurial career option [19]. The focus of iDEALab will be placed on changing the mode of thinking both of students, as well as professors: viewing the problems as well as opportunities from a different angle; practicing how to transform entrepreneurial knowledge and ideas into applicable entrepreneurial projects; the introduction of mentorship by establishing connections with the entrepreneurs from the region.

On the other hand, the university–business cooperation plays a significant role in bustling regional development and innovativeness, leading to enhanced innovative capacities of the enterprise, improved skills of students relevant to the labour market and more efficient usage of available resources (e.g. human, financial, R&D laboratories). Nevertheless, although universities are unions of students and academics, dominant focus of university–business cooperation is on academics. Students, as a pool of talents with specific motivation and priorities, can offer much more. Namely, considering that students of most universities are passive consumers of knowledge delivery service provided by the teaching staff, it can be of great benefit to adopt the concept of open innovations in curricula to take advantage of students' potential [20]. Through the outside-in open innovation process new ideas may be acquired from students and brought into the companies' innovation pipeline.

Practical work within open innovation environment offers students an opportunity to apply their knowledge and skills and get ready for their future careers, since only a small percentage of young people in WBC get practical experience while studying. On the other hand, companies are motivated to engage students through this sort of collaboration, because the employment of graduates without any practical experience causes high costs for the companies [21].

Having all this in mind, students engaged in iDEALab will get the opportunity to develop and commercialize ideas by two pathways – entrepreneurial (pursuing their own creative ideas) or open innovation (working on problems of existing companies). First route will be supported by active mentoring, entrepreneurial skill development and modern ICT infrastructure. For the second route, companies will provide detailed description of their needs and problems and encourage students to come up with their solutions. During this process student teams will have opportunity to be mentored, guided and advised by company representatives. In both cases, intellectual property issues will be treated with utmost attention.

# Main actors in iDEALab

As a cross-disciplinary and multi-stakeholder platform for entrepreneurship, collaboration with industry, innovation and commercialization, iDEALab brings together the following groups of main actors:

- students with creative ideas or interested in iDEALab programs,
- students enrolled in relevant courses (e.g. related to entrepreneurship and innovation),
- researchers,
- entrepreneurs,
- external mentors and experienced practitioners,
- SMEs and big companies,
- companies representatives,
- experienced engineers,
- solution and service providers, and
- users.

These main actors will collaborate in the co-creative environment, cross different perspectives, provide additional expertise and information, and deepen understanding about complex interactions between technologies and market.

# Main activities in iDEALab

There are seven groups of the main activities that take place in the everyday operation of iDEALab [16]:

- **Educational activities for participating students** who will help participants to obtain skills and knowledge necessary for goal achievement: workshops, trainings, case studies, scientific research.

*These activities will aim to enable students that are lab participants to effectively use their potentials with meaningful actions, in order to bring their creative engineering ideas to the next level.*

- **Educational activities for non-participating students:** problem- and work- based learning, entrepreneurial process simulation, demonstrational teaching processes.

*These activities are expected to be knowledge-spillover from the main lab projects to the university students, creating a significant impact on a bigger scale by directly influencing those that have not taken part in main labs initiatives.*

- **Mentoring activities:** guiding and helping students through joint work, consultations and meetings.

*These activities are expected to be an extension of educational activities suggested for the lab participants as well as the source of additional expertise. Mentoring activities will, unlike educational ones, provide assistance in specific actions of each team or individual,*

# White paper

*giving practical advice relevant to the project that is being mentored. This type of activities is expected to be of great help during each project's realization steps.*

- **Idea generation activities** needed for idea development or for problem solutions: individual, group and hybrid idea generation as well as virtual idea generation with included companies and other interested parties using virtual part of the lab.

*This type of activities is crucial for proper usage of lab participants' creative potential. As it is expected that the participants will enter the lab with one or more good ideas, it is a priority to properly develop those ideas. Also, if a partnering company submits a problem or a challenge that needs to be solved, lab participants are encouraged to generate creative ideas that could serve to address the issue.*

- **Communication and collaboration activities:** sharing space and lab resources for ideas development, on-site inter-team collaboration, networking with other students and interested companies, communicating with mentors, university officials, market and media, preparing and disseminating relevant information and conclusions.

*These activities are basis for the synergy effect that is highly anticipated in the lab. Without proper communication practices, it is not possible to achieve collaboration on the proposed level. Additionally, since various teams will share the same resources, it is expected for new connections and collaborations to be created between the lab participants who would elsewhere be unaware of each other.*

- **Various software - and hardware-dependent practical activities** varied by idea type: concepts development, computer simulations, simple prototype design and testing, 3D printing, project realizations, data gathering and analysis, software testing, multimedia creation, mobile technologies development, lead-user and ordinary-user testing, service providing, content analysis and many others.

*These activities are the core of the lab concept - to help students in pursuing their creative ideas through relevant training and technology put to their disposal and based on engineering knowledge. The lab environment is designed to provide full hardware, software, institutional and scientific support for the proper growth of any good students' initiative that fits the lab course of action.*

- **Project management activities:** management tasks, team meetings, process coordination, project monitoring and control.

*These activities are necessary for reliable project realisation, and are result of relevant participants' education courses.*



# Building blocks

There are five factors that have significant impact on the creative process and are seen as the building blocks of iDEALab operation [16]:

- **Motivation.**  
Researchers explain that intrinsic motivation pushes creative individuals to go beyond mundane solutions, and produce something new and different [22]. More interested in the problem area individuals are, more likely they will take the exploratory route when solving problems related to that area. Anything that leads a problem-solver to get deeply involved in focusing on or thinking about a task will enhance creative ability [23].
- **Environment.**  
To express the most of its creativity an individual needs the freedom to experiment, and to fail, in order to take the risks necessary to pursue new ideas [22]. Constraints consistently hinder creativity and decrease task motivation [23]. Any perception of external control (e.g. rewards, time pressure, surveillance, evaluation and even the expectation of evaluation) over those that are performing the tasks has negative influence on intrinsic motivation. Virtual and physical working space, as a part of environment also affects creativity. Standardized school furniture like wooden desks and chairs, white walls, and black boards is far from surrounding that can help in bringing out students creativity [24].
- **Knowledge and domain skills.**  
Research in several domains [25] has converged on the conclusion that high-level problem solving is based on detailed and highly structured knowledge, or expertise, within the domain. Creative thinking requires a mastery of skills and knowledge within the own area. One must be well founded in math, science and a specific technical field to be able to creatively solve engineering problems [22]. Creativity is dependent on knowledge but it goes beyond human intelligence [26], [27].
- **Openness to other domains.**  
An openness to new ideas and information and a willingness to be influenced by outside sources brings the capacity to connect remote (but existing) elements and produce creative links. The ability to put the LEGO bricks differently, to connect in novel and original way already existing things and technologies to solve unsolved problems is seen as one of main features of creativity [28], [29]. Openness to other domains helps in practicing lateral thinking [30] because the search for new ideas often requires a shift in the thought process and application of what is known in one domain to a new problem in the other domain. Strong background in a specific field is needed, but great results can be expected only if people are also capable of making connections between items which might not ordinarily seem connected [28].
- **Open ended problems in assignments.**  
Although knowledge is essential to innovative solution, exposure to a problem is generally considered to be the initiator of the creative problem solving process [31]. Without a problem there is no need to be creative. Open ended and problems as close as possible to

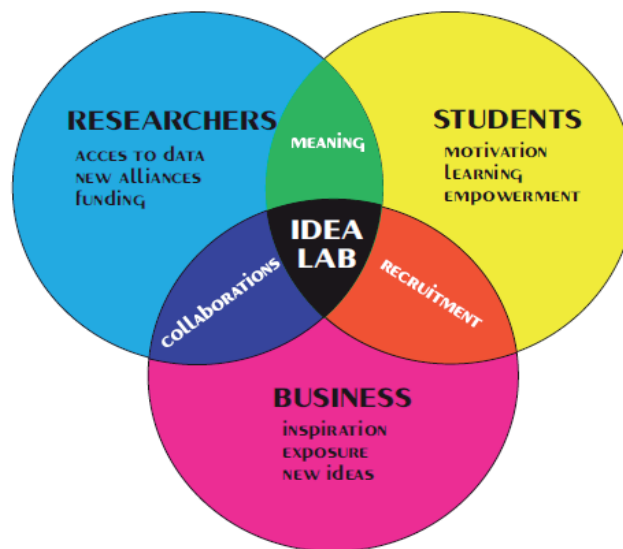
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real life problems are optimal in order to force the students to explore novel approaches or applications. These types of problems provide learning experience very close to reality, offering to the students' situations which are quite similar to one engineers experience in their everyday jobs. It is suggested that the students should be given problems for which the professor knows of no solution [22].



## iDEALab benefits

iDEALab may be described as a win-win-win situation, as it offers benefits to all involved parties – companies, students and universities.



## Benefits for students

Through iDEALab students will get the right skills to enter the labor market or to create their own business. Start-ups created through the project will directly effect on employment, especially if new young entrepreneurs hire fellows. Students will practice their creativity, learn how to work in a team and use their knowledge and initiative. In open innovation and entrepreneurial projects, students develop their specific cognitive, emotional and operational skills. They get the experience of collaboration with unknown individuals, who have different technical background and, sometimes, different interests, which is a real business environment that expects them after studies. Facing operational problems that appear in organizing the work with team members, who have different obligations and schedule at university, and often live in different cities, students become capable to recognize skills and needs of their team members, create the environment

that values diversity, adapt their own behavior, and even organize virtual community [15], [20]. All these activities will enable students to enhance their own employability. Additionally, students start to see themselves as innovators, who come to solutions of certain problems together with their team, making an effort to attract the attention of evaluating jury and other students [21].

## Benefits for universities

As intermediaries in collaboration between companies and students, universities get the range of benefits. Three the most important are [21]:

- enriched educational and learning experience for their students
- becoming one of key stakeholders in entrepreneurial ecosystem, and
- reinforcement of its relationship with industry.

Also, universities can easier explore unexplored talents of their students and offer them research internships or keep them as young researchers. Additionally, academics and university staff will update existing and develop new knowledge and skills and become able to support and mentor innovative ideas [16].

## Benefits for companies

In search for innovative solutions it is more effective to involve a diverse group of individuals outside the company, or the discipline. Therefore, companies as solution seekers turn to contributors with different background. Even though, it is very difficult to find them, since they come from different areas of society, they actually exist on one place – university. There are students who are young, creative and usually quite motivated to show what they can and learn from their own experience.

Collaborating with students, companies open the way to involving new and relevant resources, they can do business on the basis of new ideas and in this way improve their success rates [32]. They get access to unbiased knowledge and insights into opportunities that lie beyond their immediate field of view. Involving students as co-creators in innovation produces ideas that are more creative, more highly valued by customers, and more easily implemented [32]–[35]. This sort of collaboration increases speed to market, lowers costs, improves product quality and reduces risks in innovation processes, but in the same time, it asks for new management skills, different management styles, and information confidentiality [21].

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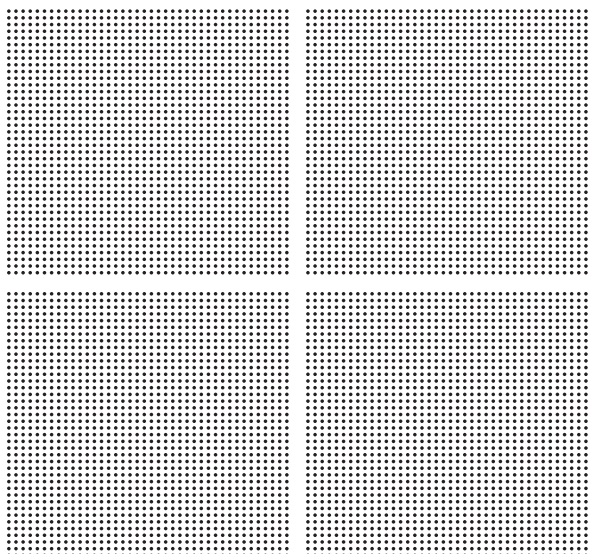
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