

ADDOPTML
Optimized 3D printed structures

ADDOPTML Midterm Meeting - Management and Impact

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Layout

Management

- Financial aspects
- Any proposed re-orientations of the networks' activities
- PR (including how the open access obligation for publications has been complied with)
- Ethics
- IP or any other issue related to the management and the implementation of the project

Impact

- Dissemination of results and publications
- Communication activities to reach the general public

Financial aspects

Eligible costs of the action are EUR 2 410 400.00

Grant reimburses 100 % of the action's eligible costs

Eligible costs:

- (a) for costs of seconded staff members
- (b) for institutional costs

	Beneficiary	Total EC Contribution	secondments per partner
Beneficiary N. 1	NTUA	717.600,00	156
Beneficiary N. 2	POLITO	184.000,00	40
Beneficiary N. 3	UCY	73.600,00	16
Beneficiary N. 4	USTUTT	46.000,00	10
Beneficiary N. 5	IDEA75	50.600,00	11
Beneficiary N. 6	SPACEAPPS	23.000,00	5
Beneficiary N. 7	IDONIAL	46.000,00	10
Beneficiary N. 8	EFW	46.000,00	10
Beneficiary N. 9	MX3D	46.000,00	10
Beneficiary N. 10	S&S	230.000,00	50
Beneficiary N. 11	RISA	230.000,00	50
Beneficiary N. 12	VUB	92.000,00	20
Beneficiary N. 13	INFERENCE	230.000,00	50
Partner N. 1	JUST	395.600,00	86
	Total Budget	2.410.400,00	

Any proposed re-orientations of the networks' activities

- The decision was made to speed up the project implementation during the 1st year to avoid delays due to pandemic related unforeseen implications in the future.
- As a result, instead of the 36 months of secondments initially scheduled, more than 90 months of secondments have been actioned.
- Now that the project is well on its way, the scheduled rate of actions will be implemented.
- Other than this, activities are implemented according to the initial plan (proposal, GA etc.).

PR (including how the open access obligation for publications has been complied with)

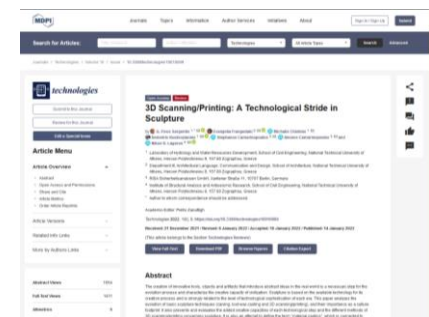
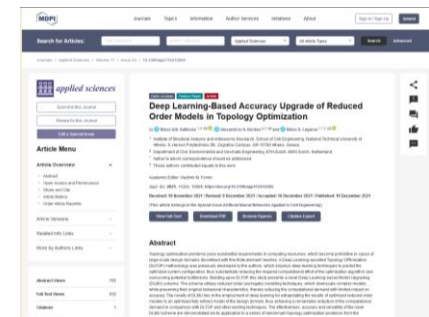
- ❑ All publications are open access.
- ❑ All journal articles are published under Gold Open Access.
- ❑ An e-copy of all outputs is made available on publication through a dedicated repository (<https://zenodo.org/> and/or <https://www.openaire.eu/>) and also [ResearchGate](#).
- ❑ The NTUA personnel uses the NTUA repository DSPACE (<https://dspace.lib.ntua.gr/xmlui/?locale-attribute=en>)) to upload master thesis, journal publications, and conference proceedings hence granting them Green Open Access.
- ❑ Updates on the project progress and outputs are regularly made through the projects social media platforms and the members' individual social media accounts (Facebook (more than **80 followers**), LinkedIn (more than **1300 impressions** in the events announced), Twitter).

Dissemination of results and publications

- ❑ Dissemination (GA, article 29)
- ❑ To this point, most of the ADDOTML outputs are uploaded in [Zenodo](#) and linked to the ADDOPTML project
 - ❑ 4 final year individual research projects undertaken at NTUA
 - ❑ 10 journal articles co-authored by ADDOPTML researchers
- ❑ All journal articles have been published Gold Open Access (MDPI) and are hence free-of-charge for any user
- ❑ Research Data will be made available when ready through the same platforms are described in the ADDOPML Data Management Plan
- ❑ The EU contribution is acknowledged in all published material [see, e.g.](#) and [also](#)

Publications

1. E. Frangedaki, L. Sardone, N.D. Lagaros, Optimized tree-shaped bamboo structural system for sustainable architecture, Journal of Architectural Engineering ASCE, 2021. (published) **WP1**
<https://ascelibrary.org/doi/abs/10.1061/%28ASCE%29AE.1943-5568.0000492> (NTUA, POLITO)
2. Nikos Ath. Kallioras, Alexandros N. Nordas and Nikos D. Lagaros, Deep learning-based accuracy upgrade of reduced order models in topology optimization, Applied Sciences, 2021. <https://www.mdpi.com/2076-3417/11/24/12005> (NTUA, INFERENCE) **WP3**
3. G.-Fivos Sargentis, Evangelia Frangedaki, Michalis Chiotinis, Demetris Koutsoyiannis, Stephanos Camarinopoulos, Alexios Camarinopoulos and Nikos D. Lagaros, 3D scanning/printing. A Technological Stride in Culture, 2021. **WP2**
<https://www.mdpi.com/2227-7080/10/1/9> (NTUA, RISA)

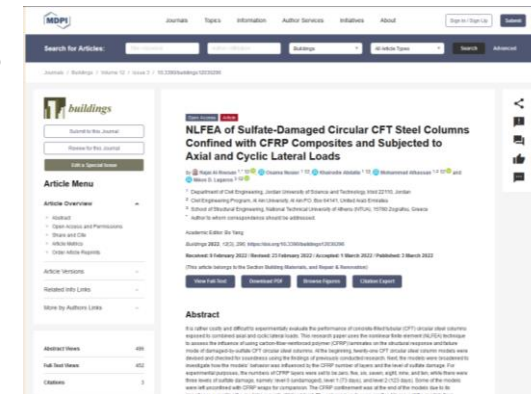


Publications

4. Dimos C. Charmpis and Nikos D. Lagaros, Cascade structural sizing optimization with large numbers of design variables, (under review), CivilEng Journal, June 2022. (UCY, NTUA) **WP1**

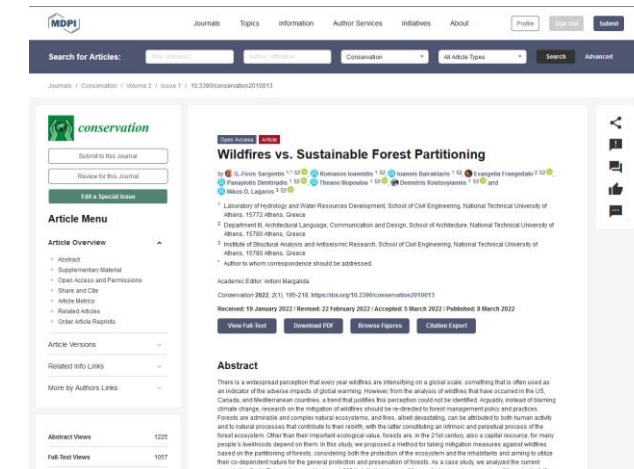
5. George Kazakis, Nikos D. Lagaros, A simple Matlab code for material design optimization using reduced order models, (under review), Materials Journal, May 2022. (NTUA, RISA) **WP1**

6. Rajai Al-Rousan, Osama Nusier, Khairedin Abdalla, Mohammad Alhassan and Nikos D. Lagaros, NLFEA of Sulfate Damaged Circular CFT Steel Columns Confined with CFRP Composites and Subjected to Axial and Cyclic Lateral Loads, *Buildings* **2022**, 12(3), 296; <https://doi.org/10.3390/buildings12030296> (JUST, NTUA) **WP2**



Publications

7. Evangelia Frangedaki, Laura Sardone, Giuseppe Carlo Marano, Nikos D. Lagaros Optimization Driven Design in Architectural, Engineering and Construction Industry: an overview, (under review), February 2022, ICE journal, (NTUA, POLITO)
8. Spyros Damikoukas, Nikos D. Lagaros Machine learning based denoising of ambient vibration generated structural response signals, (under review), June 2022, Bulletin of Earthquake Engineering journal, (NTUA, S&S, RISA)
9. G.-Fivos Sargentis, Romanos Ioannidis, Ioannis Bairaktaris, Evangelia Frangedaki, Panayiotis Dimitriadis, Theano Iliopoulou, Demetris Koutsoyiannis and Nikos D. Lagaros, Wildfires vs. Sustainable Forest Partitioning, *Conservation* **2022**, 2, 195–218.
<https://doi.org/10.3390/conservation2010013>. (NTUA, RISA, IDEA75)



Publications

10. Γ.- Φοίβου Σαργέντη, Ευαγγελίας Φραγγεδάκη, Ηλία Ταϋγету Μελετόπουλου, Νίκου Καλλιώρα, Νίκου Δ. Λαγαρού, Κατασκευές με Τρισδιάστατη Εκτύπωση - Καινοτόμες Τεχνολογικές Δυνατότητες στον Κλάδο της Κατασκευαστικής Βιομηχανίας, Περιοδικό Κτήριο, Ιούνιος 2022. (NTUA, RISA, IDEA75, INFERENCE)

ΤΕΧΝΙΚΕΣ ΣΕΛΙΔΕΣ

ΚΑΤΑΣΚΕΥΕΣ ΜΕ ΤΡΙΣΔΙΑΣΤΑΤΗ ΕΚΤΥΠΩΣΗ

ΚΑΙΝΟΤΟΜΟΙ ΤΕΧΝΟΛΟΓΙΚΕΣ ΔΥΝΑΤΟΤΗΤΕΣ
ΣΤΟΝ ΚΛΑΔΟ ΤΗΣ ΚΑΤΑΣΚΕΥΑΣΤΙΚΗΣ ΒΙΟΜΗΧΑΝΙΑΣ



Άρθρο των:
Γ. ΦΟΙΒΟΥ ΣΑΡΓΕΝΤΗ, ΕΥΑΓΓΕΛΙΑΣ ΦΡΑΓΓΕΔΑΚΗ,
ΗΛΙΑ ΤΑΥΓΕΤΟΥ ΜΕΛΕΤΟΠΟΥΛΟΥ, ΝΙΚΟΥ ΚΑΛΙΩΡΑ,
ΝΙΚΟΥ Δ. ΛΑΓΑΡΟΥ
* Σχολή Πολιτικών Μηχανικών ΕΜΠ, * Σχολή Αρχιτεκτονικών Μηχανικών ΕΜΠ

Κάθε πολιτισμική φάση χαρακτηρίζεται από τις δημιουργικές δυνατότητες αποτύπωσης των ιδεών στον πραγματικό κόσμο, που μπορούν είτε να μεταβληθούν την ποιότητα ζωής των ανθρώπων είτε να εκφράσουν την πολιτισμική τους ταυτότητα. Αυτές οι δυνατότητες εξαρτώνται από το τεχνολογικό υπόβαθρο της κάθε εποχής και τελικά αποτελούν συσσωματώματα εφαρμοσμένης γνώσης. Σ' αυτό το πλαίσιο, τα τελευταία χρόνια συμβαίνει ένα εξαιρετικά σημαντικό τεχνολογικό βήμα, που σκετιζόταν με την τρισδιάστατη εκτύπωση. Σήμερα χρησιμοποιείται ευρέως στη βιομηχανική παραγωγή, από την εκτύπωση ιστορικού εξοπλισμού έως την εκτύπωση μηχανικών μερών αυτοκινήτων. Η παραγωγή έχει αλλάξει ριζικά, μειώνοντας το κόστος και διευκολύνοντας σε μεγάλο βαθμό την παραγωγή προϊόντων, προσαρμοσμένων στις απαιτήσεις ειδικών περιπτώσεων, από την τρισδιάστατη εκτύπωση βιολογικών στο χώρο της υγείας έως και ειδικών τμημάτων στη βιομηχανία.

Diploma thesis

Tania Livanou, AUTOMATED ANALYSIS OF PARAMETRISED SURFACE STRUCTURAL SYSTEMS, November 2021, Supervised by Savvas Triantafyllou (NTUA), WP8

<https://dspace.lib.ntua.gr/xmlui/handle/123456789/55176> (Secondees from JUST contributed to the supervision)

Isidora Simatou, NON-LINEAR ANALYSIS OF THREE-DIMENSIONAL CONCRETE PRINTED MEMBERS, November 2021, Supervised by Savvas Triantafyllou (NTUA), WP8

<https://dspace.lib.ntua.gr/xmlui/handle/123456789/55174> (Secondees from JUST contributed to the supervision)

Doctoral thesis

Evangelia Frangedaki, has finalised her research based on constructions with *earth-based building materials* as a response to the lack of housing. The possibility of AM with earthen based materials as an answer to the lack of shelter's crisis is also examined. In addition, a framework aiming at the implementation of sustainable principles for post disaster housings is being investigated.

G.-Fivos Sargentis, has finalized his research on the stochastic analysis of data related to infrastructures and environment.

Communication activities to reach the general public

1. Communication (GA, article 38.1)

Promotion of the action and its results by providing targeted information to multiple audiences

- ❑ 27.5.2021 ADDOPTML seminar: 3D printing in the Construction Industry. Past, Present, and Future. The seminar was virtual and open to all public.
- ❑ This was advertised through all available channels and was attended by researchers, academics, undergraduate students across the spectrum of engineering.
- ❑ It was further attended by professionals working in the construction industry.
- ❑ The EU contribution is acknowledged in all published material. The EU emblem is used in all communications



3D Printing in Construction Industry
Past, Present and Future

Webinar

Thursday 27th May 2021
14:00 - 16:30 CET

KEYNOTE SPEAKERS

Philippe Block
(ETH)
"3D-Printed Masonry"

Christian Cremona
(Bouygues Travaux Publics)
"3D printing - Issues and challenges from a construction company's point of view"

Gijs van der Velden
(MX3D)
"The opportunities for Metal 3D Printing in Construction"

Marina Konstantatou
(Foster + Partners)
"A Journey of Digital Manufacture at Foster + Partners"

The workshop is co-organized by:
Nikos D. Lagaros
National Technical University of Athens

Giuseppe Marano
Politecnico di Torino

Bruno Briseghella
Fuzhou University

Humberto Varum
Universidade do Porto

Foster + Partners MX3D ETH Zurich

Register now free of charge

Event Registration form :
<https://bit.ly/3gMlclP>

ADDOPTML Under the auspices of ADDOPTML project and EU Commission Coorganized by Sostratus OptiStructure Sponsored by OptiStructure

Communication activities - Plans

The following actions have been decided to successfully communicate the ADDOPTML developments to the public:


- Engagement with **schools** in Greece, Belgium, Spain, and Germany: During their secondments the ADDOPTML researchers will visit local schools (at least one each) to deliver a presentation on modern structural design challenges and promote science and engineering education through their posters. Moreover, all researchers will be invited to present their work at the annual NTUA **European Researcher's Night** that is attended by 500 school children aged 12 -16.
- Each partner will prepare **two popular articles**, which will be published in 'popular engineering webpages' such as 'sciencedaily.com' and 'Research.eu'. The same articles will also be published online on the ADDOPTML website. These articles will popularize the developments to the **non-expert public** and will increase the awareness on **generative design, deployable structures, and additive manufacturing**.
- Assisted by the graphic designing professionals the partners will prepare two ADDOPTML **movies** illustrating in a form of cartoon, i) the challenge of rapidly deploying safe structures custom fit to specific environmental conditions ii) the way additive manufacturing disrupts and revolutionises the European construction sector.

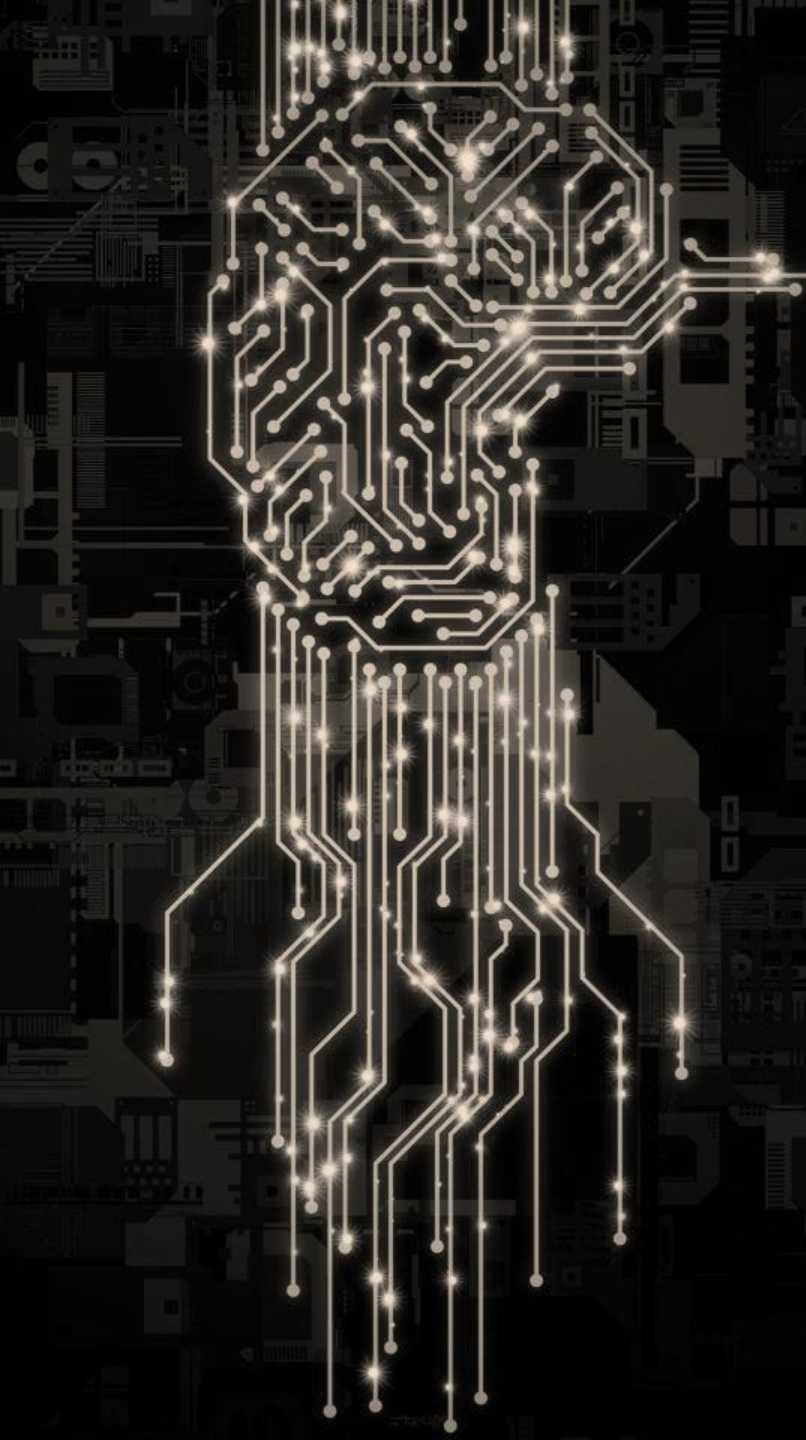
IP or any other issue related to the management and the implementation of the project

- Satisfactory scientific progress
- No delays regarding the deliverables
- There are deviations in the original secondment plan due to the pandemic
- The conditions of the pandemic were improved so instead of the 36 months of secondments initially scheduled during the 1st year of the project more than 90 months of secondments have been performed
- Day-to-day monitoring of the programmed secondment plan
- Intellectual property and exploitation will be governed by the Consortium Agreement; this will be based on the H2020 DESCA model.

Social Media

Do not forget

-  ADDOPTML Project H2020 MSCA-Rise 2020
-  @addoptml
-  ADDitively Manufactured OPTimized Structures by means of Machine Learning-ADDOPTML
- Web page: <http://addoptml.ntua.gr>
- Email: addoptml@mail.ntua.gr



Funded by
the European Union



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Optimized 3D printed structures

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