

e-diplomas: An online diplomas platform for the Greek Higher Education Institutes

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Keywords

e-diplomas, authorization, authentication, privacy enhanced technologies

1. Summary

The eDiplomas platform (<https://edipomas.gr>), developed by the Greek Universities Network (GUNet), and its integration into the EMREX network are described. The ongoing national initiative for upgrading the SIS in Greek HEIs will pave the way towards the compliance of the Greek SIS specifications with the EMREX APIs for courses, grades and credits. The platform envisaged by GUNet will combine existing technologies in order to provide maximal protection, while keeping the student records usable in a flexible but controlled manner, and enhance interoperability and collaboration between HEIs at national and European level.

2. The need

One of the most important challenges that Higher Education Institutes (HEI) have to cope with is the transfer of diplomas transcripts in a privacy preserving way and the validation of diplomas authenticity. The printed-paper certificate system has repeatedly been a cause of concern for security and reliability, because it allows fraudsters to forge certificates. Also, there is no definite mechanism to easily verify and check the authenticity of a certificate. Current approaches designed to overcome the disadvantages of paper-based academic certificates has not addressed issues like the validation of claimed certificates yet. In addition, it is based on centralized solutions that can be targeted by malicious users. Likewise, currently there is no standardised, automated method to certify university diplomas in Greece. The degree holder typically obtains a hardcopy of the original diploma from the academic registrar that needs to be verified by a public authority as authentic. The system is anachronistic, costly and insecure.

3. The e-diplomas solution

Higher Education Institutes (HEI) and their Student Information Systems (SIS) have been operating in silos as far as the diplomas issuing and verification is concerned. This has been attributed mostly to privacy and security requirements but also to the lack of appropriate protocols and APIs that would foster the semantic and technical interoperability between the SIS and 3rd parties interested in consuming diplomas related information. e-diplomas platform acts as a broker of information between SIS and those 3rd parties with a focus on privacy.

e-diplomas is the online platform responsible for the verification of HEI degrees ownership. Through e-diplomas, the citizen and owner of degrees issued by greek HEIs is able, by using their national authentication system account, to authorize a client (public Institution or company) to receive information regarding their degrees. The platform uses technologies which ensure the protection of private data as well as the authenticity of the degrees' information. By making the submission and degree verification processes simple and fast for the holder as well as the client, it is, at the same time, attempted to eliminate the phenomenon of fake and counterfeit degrees.

e-diplomas is based on an OAuth2 architecture in order to provide granular access control per diplomas section (OAuth scopes) to registered 3rd parties (OAuth Clients) upon holder's consent by using the

Authorization Code Grant method. Access is granted for a limited time, and can be revoked at any time by the holder.

A key design principle of e-diplomas is not to store personal data or diplomas information besides transient encrypted tokens and matching Social Security Numbers (SSN) of the holders required to validate access requests.

In addition to the scenario where the holder grants access to 3rd party, another scenario is when authoritative state bodies perform ex officio diplomas authenticity checks.

4. Future Plans

The e-diplomas roadmap includes:

- In order to achieve cross border authentication align with the eIDAS Regulation
- Facilitate the exchange of digital transcripts with other participant HEIs by joining EMREX
- Participate in European Blockchain Services Infrastructure (EBSI) through a national blockchain node in order to provide e-diplomas information.

5. REFERENCES

The e-diplomas portal <https://ediplomas.gr/>

GUnet Portal <https://www.gunet.gr/>

6. AUTHORS' BIOGRAPHIES

Nikos Voutsinas Leads the Systems and Software Development Group of the University of Athens and has participated, as main architect, in GUnet's projects in the field of academia and public administration. His research interests include interoperability governance, digital identities management, federated authentication and authorization, and applied cryptography. He has participated in EU funded R & D projects in the topics of distributed computing and privacy enhancing technologies. Holds an MSc in Computer Science from the University of Athens.

Lazaros Merakos received the Diploma in Electrical and Mechanical Engineering from the National Technical University of Athens, Athens, Greece, in 1978, and the M.S. and Ph.D. degrees in Electrical Engineering from the State University of New York, Buffalo, in 1981 and 1984, respectively. From 1983 to 1986, he was on the faculty of the Electrical Engineering and Computer Science Department, University of Connecticut, Storrs. From 1986 to 1994, he was on the faculty of the Electrical and Computer Engineering Department, Northeastern University, Boston, MA. During the period 1993-1994, he served as Director of the Communications and Digital Processing Research Center, Northeastern University. During the summers of 1990 and 1991, he was a Visiting Scientist at the IBM T. J. Watson Research Center, Yorktown Heights, NY. In 1994, he joined the faculty of the University of Athens, Athens, Greece, where he is presently a Professor in the Department of Informatics and Telecommunications, and Scientific Director of the Networks Operations and Management Center.

His research interests are in the design and performance analysis of communication networks, and wireless/mobile communication systems and services. He has authored more than 200 papers in the above areas. He has served as the scientific director of the Communication Networks Laboratory of the University of Athens in numerous research projects, including the projects RAINBOW, WAND, MOBIVAS, WINE, EURO-CITI, POLOS, ANWIRE, E2R, E2RII, E3, Self-NET funded by the European Union. Dr. Merakos is chairman of the board of the Greek Schools Network, and member of the board of the National Research Network of Greece. In 1994, he received the Guanella Award for the Best Paper presented at the International Zurich Seminar on Mobile Communications.