



CENTRO DE
MATEMÁTICA
UNIVERSIDADE DO PORTO

GEOMETRY AND TOPOLOGY SEMINAR

Uniformization of Riemann Surfaces and Approximations by Circle Packings

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Abstract. The main purpose of this presentation is to dive deep in the theory of Riemann surfaces, through its properties, theorems and generalizations of known results, so that, in the end of the first part, we have a total categorization of all simply connected Riemann surfaces in a simple yet beautiful statement present in the Riemann Uniformization theorem. Moreover, we shall also aboard new techniques of approximating the bi-holomorphic mappings from simply connected, bounded and open sets of \mathbb{C} given by the Uniformization theorem and investigate new results with these techniques and applications. Both theorems have huge implications on the general theory of Complex Analysis and establish important foundations, as well as promising future applications for the investigation of the boundary behaviour of Riemann mappings. Furthermore, refining the result from [1], this research provides a precise bound on one parameter of the simplicial maps associated with the circle packings and we shall also try to expand the approximation techniques for general hyperbolic Riemann surfaces. In conclusion, we will cover important developments on Riemann surfaces and mappings, matters that certainly shall bring forth new corollaries on the study of boundary behaviour and answer interesting questions on complex dynamical systems.

References:

[1] Dennis Sullivan and Burt Rodin. “The convergence of circle packings to the Riemann mapping”. In: *Journal of Differential Geometry*

FRIDAY, MAY 15

15H30

ROOM: 1.09



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There will be coffee after the talk.