A New Hybrid Strategy based in Facial Recognition From A Photo of Maria Callas: The Solved Mystery of The Unidentified Tailor

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Abstract— In 2015, a published article reflected an unknown tailor appeared in a photo with Maria Callas and Biki Atelier. The aim of this manuscript was to discover this mysterious person. This article carried out a new hybrid strategy called Images Retrieval and Face Recognition coupled with PRISMA methods in white, black and grey Literature (IRFR-PRISMAL) system to discover this enigmatic man. Results of this study demonstrated that was the tailor and fashion designer known as Alain Reynaud. The use of facial recognition with Face++ identified an unknown historical face in an old photograph being useful to forensic photography.

Keywords— Face recognition system; image retrieval service; Maria Callas; Biki

I. INTRODUCTION

In 2023, the first hundredth anniversary of the Maria Callas's birth will be celebrated around the world. In the last years, the number of books [1-10] and articles [11,12] have been published to know the life of this American-born Greek operatic soprano from family and friend's approach being one of them the focus of 'operatic gastromusicology' [13], which included five primary functions of food in opera as are social, intimate, denotative, medicinal, and dietary. The article reflected the influence of Milanese dressmaker Biki in the Callas's weight loss and wardrobe. In fact, the famous operatic soprano acquired more than 200 dresses, 150 pairs of shoes and 300 hats [8]. However, Polzonetti [13] indicated, in the Figure 4 of his article, that photo, dated in 1958, included to Maria Callas, Biki and 'unidentified man' suggesting that is possibly a tailor in Biki's shop. To discover this per-son, a possible solution could be the use of face recognition techniques [14] which have been used in unconstrained environments [15] or to recognize juvenile faces [16] and to detect micro-facial expression recognition [17], among others. The aim of this study was to apply artificial intelligence using combinate of a face recognition system and an image retrieval service allowed to know the name of an un-known tailor in this enigmatic photo and to search his possible relationship with Maria Callas and Biki Atelier.

II. MATERIALS AND METHODS

We have used artificial intelligence using an image retrieval service (e.g., Google Im-ages) combined with a face recognition system Face++ [18], adapting the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) procedure [19]. This new procedure has been called, by our group, as Images Retrieval and Face Recognition coupled with PRISMA methods in white, black and grey Literature (IRFR-PRISMAL) system (Figure 1) to be applied, at the first time, in this manuscript.
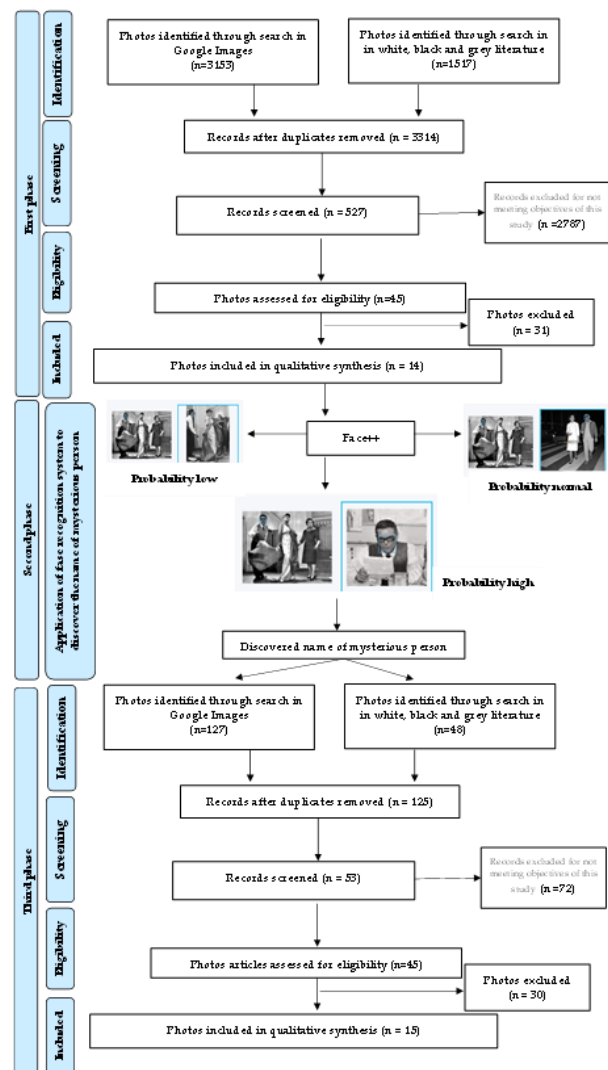

Fig. 1. Flow diagram for Images Retrieval and Face Recognition coupled with PRISMA methods in white, black and grey Literature (IRFR-PRISMAL) system applying in photos to discover the 'unidentified man' in the photo, at 1958, of Maria Callas and Biki Atelier.

III. RESULTS

This method is grouped in three phases:

• First, it contains several steps. First, the search strategy was conducted to find photos by including two main searches based on: "Maria Callas" or "Callas" AND "Biki" or "Elvira Leonardi" or "Elvira Leonardi Bouyere". On the other hand, as exclusion criteria two reasons were the following; photos in which Maria Callas and Biki were not used and photos were not displayed. The search date was up to September 18, 2022. Once all search terms have been combined, we have a final number of photos for each database including Google Images and photos published in 'white' (published journal papers, conference proceedings and books), 'grey' (preprints, e-prints, technical reports, lectures, data sets, au-dio-video media and blogs) and 'black' (ideas, concepts and thoughts) literature [20,21], followed of four steps as are; i) to remove duplicate photos, ii) to screen photos and a number of photos were excluded for not meeting objectives of this study, iii) to review photos to assess their eligibility for inclusion in this paper and to exclude photos where the unknown person did not appear, and iv) to include photos in qualitative synthesis to be applied in the second phase.

• Second, selected previous photos were integrated all of them in the Face++ [18], which is based on a structure called deep pyramid convolutional neural network (DPCNN) [22]. Face++ checked the likelihood that two faces, being one of them extracted from the article of Polzonetti [13], in four facial regions, as are eyebrows, eyes, nose and mouth, belong to the same person and classified with three inbuilt thresholds: 'Low', 'Normal' and 'High'. According to Khanna et al. [23], we ap-plied the 'High' value as the decision boundary for verification. Face++ has mean accuracy of 0.9950 ± 0.0036 [24]. It helped to discover the name of unknown tailor who was Alain Reynaud (born in 1924 and died 1982).

• Third, we repeated the first phase but in this case with name of the known tailor.

IV. DISCUSSION

Alain Reynaud had worked in Paris and New York with Jacques Fath and Maurice Rentner, respectively [25, p. 127]. In 1951, he known to Biki in Beistegui Bal Oriental (also called the Bal of the Century) at Venice (Italy) and one year later, she proposed, in Parisian fashion, to him to join at the Biki's company [26] but he rejected her proposal [27]. In 1957, he married with Roberta; Biki's daughter, in Milan (Italy). The wedding dress of Roberta Bouyeure-Reynaud was the last piece coming Genevieve Fath from the Maison Fath. After his wedding with Roberta, Alain established himself in Milan and worked with/for Biki until his premature death in 1982 [28].

Biki changed the concept of work and generated a recognizable style and brand in her establishment being since Reynaud's entry, she fortunately thought that the fashion de-signer was involved in the management of the manufacturing process [29]. Furthermore, her success was important due to her husband, the antique dealer Robert Bouyeure, that had an international network of connections necessary to expand your fashion empire [30]. After the death of her son-in-law, she acknowledged that he was responsible for doing away with Callas's terrible clothes and making her into a trend setter. Alain made her into a high-fashion modelter [9, p. 69] and Maria Callas was remained until Reynaud's death, being her loyalty demonstrated refusing the offers from Dior, St.

Laurent and Balenciaga [9, p. 110]. On the other hand, Biki justified as Reynaud was key in Maria's metamorphosis [8], when her dramatic weight loss, teaching her how to dress, walking and choosing the right accessories [3, p. 72].

Polzonetti [13] indicated that Maria Callas wanted to lose weight by herself or influenced by other persons, such as the Milanese dressmaker Biki. In our viewpoint, the in-fluence of Reynaud in this topic should not be forgotten. We think that he was not only her tailor but also her friend, as evidenced by the photos walking through the streets of Milan in 1968 [31].

In conclusion, the new IRFR-PRISMAL system is useful to determine unknown people in photography and with application in the facial recognition for forensic examiners.

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