

# DATING CHALLENGE

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## Introduction

In the absence of convincing documentation, the dating of a painting is based on its adherence to the chronology of the artist’s common practice, in terms of, for example, subject matter, materials used, color palette, compositional style, and brushwork. Some undocumented paintings present difficult dating challenges with their mixture of features crossing different periods of their creator’s artistic development. Different datings in these difficult cases can alter the art historian’s evaluation of the artist’s development.

When dating relies on categorizing style and technique issues, computer-based image processing schemes intended to produce set membership decisions from comparison with training sets should prove useful. To facilitate the cross-disciplinary collaboration that needs to occur for the development of the right tools for such a task, this document describes some dating challenges in van Gogh studies for which a high quality dataset is available to selected academic teams of researchers. In particular, the issue raised concerns the dating of paintings in either Vincent van Gogh’s Paris phase (ending early in 1888) or his following late French period.

## Dating F386, F572, and F605

The dates of production of the three Van Gogh paintings

- F386 :: “Still Life: Potatoes in a Yellow Dish” [39 x 47]
- F572 :: “Willows at Sunset” [31.6 x 34.3]
- F605 :: “Crab on its Back ” [38 x 46.5]

are unresolved issues in Van Gogh scholarship. [All dimensions are in centimeters, with height before width.] For each of these paintings, some scholars would date the

painting in question from his period in Paris ending early in 1888, while others would date this painting from his subsequent period in Arles and St. Rémy.

Training sets have been devised with eight paintings from the Paris period

- F297 :: “A Skull” [43 x 31]
- F358 :: “Still Life: Romans Parisiens” [53.7 x 72.5 - 72.7]
- F360 :: “Still Life with Plaster Saturette, a Rose and Two Novels” [55 x 46.5]
- F371 :: “Japonaiserie: The Flowering Plum Tree” (after Hiroshige) [55 x 46]
- F374 :: “Red Cabbage and Onions” [50 x 64.5]
- F452 :: “Four Cut Sunflowers” [60 x 100]
- F469 :: “Self-Portrait with Straw Hat” [40.5 x 32.5]
- F524 :: “Self-Portrait with Pipe and Straw Hat” [42 x 30]

and eight from the Arles - St. Rémy period

- F392 :: “Blossoming Almond Branch in a Glass” [24 x 19]
- F411 :: “Wheatfield” [54 x 65]
- F415 :: “Seascape at Saintes-Maries” [51 X 64]
- F441 :: “The Baby Marcelle Roulin” [35 x 24.5]
- F451 :: “The Sower” [32 x 40]
- F475 :: “The Green Vineyard” [72 x 92]
- F538 :: “Portrait of Camille Roulin” [40.5 x 32.5]
- F607 :: “Leather Clogs” [32.5 x 40.5]

The question is to ascertain what features distinguish the two test sets and subsequently can be used to attempt to associate each of the dating candidates with one group or the other. The ensuing challenge will be to convert the mathematical features of distinction into language familiar to the art historian.

## Art Historical Distinctions

In distinguishing paintings by Vincent as from his Paris period or his later period in southern France, art historians rely on several general statements regarding shifts in his practice, including:

- The number of small strokes is greater in Paris than in Arles.
- A broader handling of the brush is employed in Arles, leading to more dramatic, larger scale brushwork.
- In Arles, Vincent composed more paintings by first laying in broad areas of color and working in details with surface strokes.
- The contour lines are more comprehensively used and wider in Arles.
- Colors appear more saturated in Arles due to the filling in of larger areas.

As noted earlier, the three paintings in question (F386, F572, F605) each exhibit some general features associated with Arles, and others associated with Paris. This is why these three paintings offer such a challenge.

## Dataset

With any museum’s understandable sensitivity to the uncontrolled distribution of high-resolution color images of the paintings in their collection, the image data to be provided for the dating challenges presented in this document will be “checkerboarded” on the right half. The right half of each high resolution color image will have every other square blacked out in a checkerboard pattern, which makes the images unappealing for unauthorized commercial reproduction. But for the set membership discrimination image processing task at hand, the assumption being made is that the half-checkerboarding does not interfere significantly with the image processing - that may in fact begin with a segmentation of the painting into manageable blocks - in that the remaining unblackened squares exhibit essentially the same statistical features as in the full set of squares covering the entire painting, at least up to the scale of the squares. In the dataset for the dating challenges in this document the checkerboard squares are 200 x 200 pixels in images of approximately 200 dpi across the painting surface. The reason for checkerboarding only half of the painting is to preserve some portion of the image at a larger scale.



f297.tif



f358.tif



f360.tif



f371.tif



f374.tif



f386.tif



f392.tif



f411.tif



f415.tif



f441.tif



f451.tif



f452.tif



f469.tif



f475.tif



f524.tif



f538.tif



f572.tif



f605.tif



f607.tif