Predicting the Results of Evaluation Procedures of Academics

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Abstract. *Background.* The 2010 reform of the Italian university system introduced the National Scientific Habilitation (ASN) as a requirement for applying to permanent professor positions. Since the CVs of the 59149 candidates and the results of their assessments have been made publicly available, the ASN constitutes an opportunity to perform analyses about a nation-wide evaluation process. *Objective.* The main goals of this paper are: (i) predicting the results of the ASN using only the information contained in the candidates CVs; (ii) identifying a small set of quantitative indicators that can be used to perform accurate predictions. *Approach.* To this end, Semantic Web technologies are used to extract and enrich the information in the applicants CVs, and machine learning methods are used to predict the results of the habilitation. *Results.* For predicting the success in the role of Associate Professor, our best models have an F-measure of 0.921. Overall, the models have F-measure values higher than 0.6 in 162/184 (88%) recruitment fields. The model based on the top 15 predictors have F-measure values higher than 0.6 in 153/184 (83.2%) recruitment fields. Similar results have been achieved for the role of Full Professor. *Evaluation.* The proposed approach outperforms the other models developed to predict the results of researchers evaluation procedures. *Conclusions.* Such results allow the development of an automated system for supporting both candidates and committees in the future ASN sessions.

1 Introduction

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Table 1. Performance of SVM for professional *level I (Full Professor)*. Each row corresponds to a RF. The results are ordered in descending order with respect to the F-measure values. Non-bibliometric RFs have a gray background.

SD	P	R	FM	SD	P	R	FM	SD	P	R	FM	S	P	R	FM
09/D1	0.946	0.939	0.942	11/C3	0.811	0.754	0.782	03/D1	0.682	0.738	0.709	06/I1	0.583	0.683	0.629
11/E4	0.899	0.908	0.904	05/B1	0.776	0.787	0.781	08/A1	0.737	0.683	0.709	03/C2	0.640	0.615	0.627
09/E3	0.921	0.886	0.903	09/F2	0.787	0.774	0.780	10/L1	0.686	0.729	0.707	05/C1	0.552	0.727	0.627
11/D2	0.866	0.922	0.893	10/N1	0.767	0.793	0.780	11/C1	0.706	0.706	0.706	09/A3	0.636	0.618	0.627
06/L1	0.860	0.925	0.891	10/D1	0.793	0.767	0.780	13/D2	0.714	0.694	0.704	13/A2	0.633	0.620	0.626
11/D1	0.883	0.883	0.883	06/M1	0.785	0.773	0.779	13/D4	0.698	0.710	0.704	07/B2	0.625	0.625	0.625
08/A2	0.854	0.911	0.882	08/A3	0.778	0.778	0.778	14/A1	0.724	0.677	0.700	09/E1	0.621	0.621	0.621
06/F2	0.929	0.839	0.881	13/A4	0.761	0.794	0.777	11/A1	0.700	0.700	0.700	06/C1	0.580	0.667	0.620
12/B2	0.900	0.857	0.878	09/G2	0.809	0.745	0.776	06/E2	0.690	0.707	0.699	09/B3	0.600	0.632	0.615
05/I1	0.869	0.876	0.872	09/H1	0.763	0.787	0.775	12/C2	0.667	0.727	0.696	05/A2	0.571	0.667	0.615
10/F3	0.889	0.842	0.865	06/F1	0.746	0.806	0.775	04/A1	0.684	0.709	0.696	13/B5	0.667	0.571	0.615
08/D1	0.854	0.866	0.860	14/A2	0.804	0.740	0.771	05/D1	0.654	0.737	0.693	10/D4	0.563	0.675	0.614
06/N1	0.843	0.864	0.854	09/F1	0.727	0.821	0.771	04/A2	0.667	0.717	0.691	10/M2	0.630	0.586	0.607
11/E3	0.846	0.863	0.854	14/D1	0.745	0.792	0.768	12/H2	0.714	0.667	0.690	09/A1	0.647	0.564	0.603
12/D2	0.850	0.850	0.850	14/C2	0.759	0.774	0.766	11/A3	0.708	0.671	0.689	01/A6	0.667	0.545	0.600
07/H4	0.824	0.875	0.848	12/D1	0.819	0.720	0.766	08/F1	0.690	0.678	0.684	07/F2	0.667	0.545	0.600
09/C1	0.889	0.800	0.842	04/A3	0.756	0.773	0.764	08/B2	0.692	0.675	0.684	01/A3	0.595	0.602	0.599
02/C1	0.830	0.852	0.841	10/F1	0.756	0.773	0.764	06/A4	0.628	0.750	0.684	02/B1	0.558	0.614	0.585
14/C1	0.828	0.849	0.838	08/E2	0.775	0.750	0.762	09/D2	0.652	0.714	0.682	07/H5	0.538	0.636	0.583
04/A4	0.806	0.870	0.837	12/G1	0.727	0.800	0.762	01/A1	0.689	0.674	0.681	10/A1	0.609	0.557	0.582
06/A3	0.843	0.819	0.831	09/E4	0.794	0.730	0.761	12/C1	0.692	0.655	0.673	07/D1	0.563	0.600	0.581
05/G1	0.817	0.842	0.829	08/B3	0.750	0.771	0.761	05/A1	0.662	0.681	0.671	10/D2	0.542	0.619	0.578
01/B1	0.810	0.850	0.829	06/E3	0.771	0.750	0.761	03/A2	0.670	0.670	0.670	09/D3	0.520	0.650	0.578
05/H2	0.804	0.854	0.828	11/E1	0.775	0.743	0.759	09/G1	0.750	0.600	0.667	07/G1	0.565	0.591	0.578
11/E2	0.864	0.792	0.826	06/A2	0.727	0.790	0.757	13/C1	0.675	0.659	0.667	12/B1	0.536	0.625	0.577
05/B2	0.781	0.877	0.826	11/C5	0.753	0.753	0.753	06/D5	0.640	0.696	0.667	07/A1	0.559	0.576	0.567
06/D1	0.811	0.837	0.824	12/A1	0.737	0.769	0.753	10/D3	0.667	0.667	0.667	13/B4	0.579	0.550	0.564
07/F1	0.793	0.852	0.821	11/C2	0.732	0.774	0.752	07/E1	0.643	0.675	0.659	10/I1	0.611	0.524	0.564
13/B3	0.829	0.810	0.819	01/A5	0.750	0.750	0.750	12/E3	0.676	0.641	0.658	02/B2	0.553	0.565	0.559
06/M2	0.825	0.813	0.819	05/E1	0.700	0.800	0.747	12/E1	0.622	0.683	0.651	12/H3	0.600	0.500	0.545
06/B1	0.774	0.857	0.814	06/D3	0.722	0.765	0.743	07/C1	0.700	0.609	0.651	09/E2	0.526	0.556	0.541
13/B2	0.796	0.830	0.813	08/E1	0.765	0.722	0.743	09/A2	0.636	0.667	0.651	14/B2	0.550	0.524	0.537
13/D1	0.831	0.793	0.812	05/E2	0.699	0.791	0.742	06/D6	0.629	0.672	0.650	10/E1	0.545	0.522	0.533
02/B3	0.790	0.824	0.807	11/A5	0.767	0.719	0.742	10/N3	0.688	0.611	0.647	03/B1	0.520	0.542	0.531
06/E1	0.770	0.838	0.803	07/H1	0.769	0.714	0.741	05/H1	0.620	0.674	0.646	10/M1	0.526	0.526	0.526
06/F4	0.771	0.835	0.802	10/F2	0.755	0.725	0.740	13/D3	0.621	0.667	0.643	06/A1	0.485	0.571	0.525
06/H1	0.783	0.818	0.800	03/A1	0.724	0.750	0.737	09/C2	0.654	0.630	0.642	14/B1	0.519	0.467	0.491
03/D2	0.800	0.800	0.800	08/C1	0.741	0.723	0.732	13/A3	0.667	0.611	0.638	12/H1	0.500	0.467	0.483
11/C4	0.822	0.771	0.796	12/G2	0.682	0.789	0.732	01/A2	0.610	0.667	0.637	08/B1	0.467	0.500	0.483
12/E2	0.792	0.792	0.792	13/A1	0.761	0.695	0.727	06/D2	0.571	0.718	0.636	03/B2	0.500	0.462	0.480
10/C1	0.780	0.800	0.790	07/B1	0.722	0.722	0.722	11/B1	0.667	0.606	0.635	02/A2	0.558	0.420	0.479
06/G1	0.766	0.808	0.787	11/A2	0.717	0.717	0.717	12/F1	0.650	0.619	0.634	10/H1	0.400	0.462	0.429
11/A4	0.787	0.787	0.787	13/B1	0.696	0.738	0.716	03/C1	0.613	0.655	0.633	02/A1	0.394	0.438	0.414
10/B1	0.778	0.790	0.784	09/B2	0.625	0.833	0.714	09/B1	0.667	0.600	0.632	07/H3	0.385	0.417	0.400
08/A4	0.769	0.800	0.784	01/A4	0.747	0.683	0.713	13/A5	0.611	0.647	0.629	05/F1	0.250	0.182	0.211
07/H2	0.750	0.818	0.783	10/G1	0.700	0.724	0.712	06/D4	0.609	0.651	0.629	06/F3	0.250	0.167	0.200

Table 2. Performance of SVM for professional *level II (Associate Professor)*. Each row corresponds to a RF. The results are ordered in descending order with respect to the F-measure values. Non-bibliometric RFs have a gray background.

SD	P	R	FM	SD	P	R	FM	SD	P	R	FM	S	P	R	FM
11/E4	0.894	0.951	0.922	09/D3	0.828	0.800	0.814	13/B5	0.731	0.792	0.760	10/A1	0.652	0.706	0.678
07/F1	0.884	0.938	0.910	09/G2	0.781	0.848	0.813	13/A4	0.716	0.807	0.759	03/D2	0.639	0.719	0.676
14/C2	0.887	0.925	0.906	09/E4	0.813	0.813	0.813	06/A4	0.719	0.804	0.759	09/A3	0.698	0.649	0.673
06/F2	0.897	0.910	0.904	12/G1	0.792	0.836	0.813	08/B2	0.796	0.722	0.757	09/D2	0.660	0.686	0.673
09/D1	0.879	0.927	0.902	12/A1	0.775	0.846	0.809	04/A3	0.694	0.826	0.754	10/E1	0.591	0.764	0.667
11/D2	0.908	0.879	0.893	12/C1	0.794	0.820	0.807	13/A1	0.724	0.787	0.754	04/A2	0.612	0.732	0.667
14/C1	0.873	0.915	0.893	09/E1	0.815	0.800	0.807	05/H1	0.694	0.827	0.754	07/H4	0.647	0.688	0.667
08/D1	0.866	0.904	0.884	13/D3	0.778	0.836	0.806	02/C1	0.725	0.776	0.750	04/A1	0.630	0.689	0.658
09/E2	0.850	0.919	0.883	11/C1	0.723	0.906	0.804	08/A1	0.737	0.757	0.747	07/H2	0.618	0.700	0.656
05/I1	0.863	0.902	0.882	06/D1	0.773	0.835	0.803	03/B1	0.699	0.802	0.747	06/D4	0.639	0.670	0.654
06/N1	0.811	0.948	0.875	06/A1	0.757	0.839	0.796	01/B1	0.718	0.773	0.744	13/D4	0.649	0.658	0.653
11/D1	0.841	0.911	0.874	05/B2	0.781	0.809	0.794	11/C4	0.702	0.786	0.742	06/D5	0.610	0.692	0.649
06/L1	0.819	0.906	0.860	11/A5	0.755	0.838	0.794	12/G2	0.750	0.733	0.742	07/E1	0.630	0.667	0.648
12/D2	0.866	0.853	0.859	11/C5	0.735	0.862	0.793	03/C2	0.738	0.738	0.738	01/A2	0.615	0.646	0.631
05/G1	0.836	0.878	0.857	14/B1	0.754	0.833	0.792	09/C2	0.692	0.783	0.735	05/F1	0.646	0.609	0.627
10/F1	0.805	0.906	0.853	11/A1	0.756	0.830	0.791	05/C1	0.688	0.789	0.735	06/E3	0.620	0.633	0.626
06/M1	0.813	0.892	0.851	10/D3	0.750	0.831	0.789	03/A1	0.698	0.764	0.730	10/M1	0.592	0.652	0.621
05/H2	0.824	0.880	0.851	05/A1	0.745	0.831	0.786	08/F1	0.677	0.788	0.728	13/B4	0.597	0.642	0.619
11/E2	0.842	0.854	0.848	13/D1	0.770	0.799	0.784	14/A1	0.664	0.805	0.728	11/E1	0.619	0.593	0.606
08/C1	0.832	0.865	0.848	06/C1	0.744	0.826	0.783	13/B1	0.694	0.766	0.728	11/B1	0.564	0.654	0.606
02/B3	0.808	0.889	0.847	07/B1	0.793	0.774	0.783	12/E2	0.708	0.741	0.724	01/A1	0.556	0.652	0.600
13/B3	0.819	0.875	0.846	05/E2	0.725	0.848	0.781	01/A4	0.665	0.793	0.723	13/C1	0.575	0.627	0.600
12/E1	0.835	0.856	0.845	01/A3	0.765	0.796	0.780	13/D2	0.707	0.736	0.721	02/B1	0.605	0.595	0.600
11/A4	0.798	0.896	0.844	08/B3	0.780	0.780	0.780	09/A2	0.705	0.738	0.721	09/B1	0.600	0.600	0.600
06/A2	0.801	0.886	0.842	01/A5	0.786	0.772	0.779	07/G1	0.720	0.720	0.720	10/F3	0.551	0.655	0.598
10/C1	0.802	0.885	0.842	06/E2	0.732	0.833	0.779	11/C2	0.676	0.764	0.718	07/H1	0.586	0.607	0.596
06/M2	0.811	0.868	0.839	09/H1	0.740	0.819	0.778	12/B2	0.740	0.698	0.718	03/B2	0.628	0.563	0.593
14/D1	0.816	0.860	0.838	11/A2	0.735	0.826	0.778	12/C2	0.704	0.731	0.717	10/I1	0.588	0.577	0.583
06/F4	0.793	0.885	0.836	11/A3	0.720	0.845	0.777	02/B2	0.685	0.748	0.715	14/B2	0.529	0.649	0.583
12/D1	0.813	0.862	0.836	08/E1	0.757	0.796	0.776	11/C3	0.650	0.790	0.714	10/H1	0.540	0.630	0.581
08/A2	0.838	0.830	0.834	14/A2	0.760	0.784	0.772	06/F1	0.673	0.747	0.708	13/A2	0.614	0.530	0.569
10/D1	0.806	0.862	0.833	12/F1	0.755	0.787	0.771	13/A3	0.679	0.736	0.707	07/A1	0.538	0.600	0.568
06/B1	0.804	0.861	0.832	03/D1	0.768	0.774	0.771	10/D4	0.659	0.754	0.704	07/H3	0.517	0.625	0.566
05/B1	0.801	0.863	0.831	09/C1	0.754	0.788	0.770	07/B2	0.652	0.750	0.698	10/D2	0.506	0.609	0.553
04/A4	0.795	0.867	0.830	06/E1	0.719	0.826	0.769	12/H3	0.679	0.714	0.696	10/N3	0.510	0.581	0.543
05/E1	0.788	0.876	0.830	12/E3	0.705	0.846	0.769	06/D6	0.649	0.747	0.695	07/F2	0.550	0.524	0.537
11/E3	0.828	0.828	0.828	06/D3	0.747	0.790	0.768	10/L1	0.672	0.714	0.692	12/H2	0.500	0.522	0.511
13/B2	0.829	0.824	0.826	09/E3	0.768	0.768	0.768	07/D1	0.621	0.766	0.686	01/A6	0.500	0.519	0.509
09/B3	0.809	0.844	0.826	10/F2	0.718	0.824	0.767	10/N1	0.651	0.726	0.686	08/B1	0.500	0.500	0.500
10/B1	0.764	0.893	0.824	06/H1	0.728	0.808	0.766	09/G1	0.658	0.714	0.685	13/A5	0.472	0.472	0.472
08/E2	0.772	0.884	0.824	05/D1	0.738	0.794	0.765	03/C1	0.685	0.685	0.685	06/F3	0.600	0.360	0.450
09/F2	0.804	0.845	0.824	05/A2	0.765	0.765	0.765	07/C1	0.679	0.691	0.685	07/H5	0.389	0.467	0.424
09/F1	0.809	0.833	0.821	06/I1	0.761	0.769	0.765	08/A4	0.667	0.704	0.685	09/B2	0.333	0.300	0.316
06/A3	0.816	0.822	0.819	06/D2	0.748	0.781	0.764	09/A1	0.646	0.721	0.681	12/H1	0.286	0.273	0.279
08/A3	0.800	0.831	0.815	06/G1	0.755	0.766	0.761	10/M2	0.660	0.705	0.681	02/A2	0.471	0.148	0.225
12/B1	0.788	0.844	0.815	10/G1	0.712	0.817	0.761	03/A2	0.669	0.689	0.679	02/A1	0.240	0.043	0.074

Table 3. Performance of SVM for professional *level I (Full Professor)* and *II (Associate Professor)*. Each row corresponds to a SA. The results are ordered in descending order with respect to the F-measure values. Non-bibliometric SAs have a gray background.

	Full Professor			**Associate Professor**		
AREA	**P**	**R**	**FM**	**P**	**R**	**FM**
01	0.716	0.760	0.737	0.692	0.753	0.721
02	0.598	0.722	0.654	0.629	0.635	0.632
03	0.630	0.653	0.641	0.700	0.681	0.690
04	0.730	0.794	0.760	0.694	0.800	0.743
05	0.679	0.773	0.723	0.705	0.839	0.766
06	0.709	0.825	0.762	0.736	0.855	0.791
07	0.634	0.606	0.620	0.686	0.709	0.697
08	0.754	0.812	0.782	0.768	0.794	0.781
09	0.791	0.743	0.767	0.777	0.854	0.814
11/E	0.860	0.882	0.871	0.769	0.872	0.817
10	0.760	0.652	0.702	0.698	0.834	0.760
11	0.785	0.751	0.768	0.731	0.863	0.792
12	0.747	0.766	0.757	0.779	0.820	0.799
13	0.648	0.695	0.670	0.685	0.736	0.710
14	0.777	0.824	0.800	0.775	0.877	0.823
08 non-bibl.	0.778	0.789	0.783	0.810	0.850	0.829

Table 4. Performance of SVM for professional *level I (Full Professor)*. Only the top 15 features have been used for the classification. Each row corresponds to a RF. The results are ordered in descending order with respect to the F-measure values. Non-bibliometric RFs have a gray background.

SD	P	R	FM	SD	P	R	FM	SD	P	R	FM	S	P	R	FM
09/D1	0.954	0.973	0.963	06/M1	0.809	0.833	0.821	10/L1	0.731	0.792	0.760	07/B1	0.667	0.667	0.667
07/F1	0.962	0.926	0.943	13/B2	0.792	0.851	0.821	06/E2	0.717	0.805	0.759	10/D2	0.667	0.667	0.667
05/I1	0.870	0.992	0.927	09/A3	0.926	0.735	0.820	12/E3	0.750	0.769	0.759	07/A1	0.667	0.667	0.667
06/F2	0.906	0.935	0.921	08/E1	0.900	0.750	0.818	07/B2	0.690	0.833	0.755	07/C1	0.737	0.609	0.667
11/E4	0.864	0.969	0.913	06/B1	0.751	0.881	0.811	01/A4	0.763	0.744	0.753	12/E1	0.651	0.683	0.667
11/E2	0.976	0.854	0.911	06/D3	0.750	0.882	0.811	13/A1	0.753	0.753	0.753	03/A2	0.645	0.682	0.663
11/E3	0.873	0.941	0.906	13/A4	0.773	0.853	0.811	09/H1	0.737	0.768	0.752	09/B3	0.733	0.579	0.647
06/L1	0.862	0.943	0.901	13/B3	0.810	0.810	0.810	03/D1	0.734	0.770	0.752	11/A5	0.704	0.594	0.644
11/D1	0.875	0.909	0.892	06/H1	0.800	0.818	0.809	13/C1	0.769	0.732	0.750	10/G1	0.686	0.603	0.642
08/D1	0.843	0.944	0.890	09/E4	0.829	0.784	0.806	05/D1	0.637	0.905	0.748	01/A5	0.615	0.667	0.640
08/A2	0.840	0.933	0.884	06/E1	0.747	0.868	0.803	11/A1	0.759	0.733	0.746	06/D6	0.638	0.638	0.638
14/C1	0.830	0.941	0.882	09/B1	0.800	0.800	0.800	09/D3	0.696	0.800	0.744	06/D5	0.625	0.652	0.638
02/C1	0.832	0.933	0.880	05/E1	0.711	0.914	0.800	02/B2	0.800	0.696	0.744	10/M1	0.710	0.579	0.638
07/H4	0.875	0.875	0.875	08/A3	0.800	0.800	0.800	10/M2	0.697	0.793	0.742	09/D2	0.609	0.667	0.636
10/F3	0.850	0.895	0.872	05/A2	0.667	1.000	0.800	11/A2	0.708	0.767	0.736	10/N3	0.600	0.667	0.632
11/D2	0.826	0.922	0.871	11/A4	0.790	0.803	0.797	09/E1	0.710	0.759	0.733	05/H1	0.612	0.652	0.632
12/D1	0.839	0.890	0.864	09/F2	0.803	0.790	0.797	11/C2	0.695	0.774	0.732	07/G1	0.609	0.636	0.622
06/N1	0.787	0.950	0.861	01/A1	0.727	0.870	0.792	06/A2	0.654	0.827	0.730	07/E1	0.610	0.625	0.617
06/D1	0.808	0.913	0.857	08/A4	0.750	0.840	0.792	11/B1	0.767	0.697	0.730	09/E2	0.571	0.667	0.615
13/D1	0.800	0.920	0.856	08/B2	0.739	0.850	0.791	12/C2	0.727	0.727	0.727	07/H5	0.583	0.636	0.609
11/C3	0.887	0.825	0.855	06/F1	0.736	0.855	0.791	13/A5	0.684	0.765	0.722	10/D4	0.615	0.600	0.608
12/E2	0.788	0.931	0.854	08/F1	0.783	0.797	0.790	03/C1	0.672	0.776	0.720	12/H2	0.556	0.667	0.606
02/B3	0.797	0.914	0.851	09/F1	0.762	0.821	0.790	03/C2	0.667	0.769	0.714	05/C1	0.667	0.545	0.600
09/C1	0.850	0.850	0.850	08/B3	0.778	0.800	0.789	09/A2	0.714	0.714	0.714	07/H2	0.667	0.545	0.600
05/B2	0.810	0.895	0.850	10/B1	0.784	0.790	0.787	13/A2	0.733	0.685	0.708	10/E1	0.583	0.609	0.596
05/B1	0.807	0.893	0.848	10/D1	0.846	0.733	0.786	01/A2	0.641	0.787	0.707	01/A3	0.627	0.566	0.595
08/A1	0.818	0.878	0.847	11/C5	0.756	0.808	0.781	12/H1	0.632	0.800	0.706	06/D4	0.657	0.535	0.590
01/B1	0.772	0.929	0.843	14/A1	0.758	0.806	0.781	13/D3	0.750	0.667	0.706	03/B2	0.750	0.462	0.571
09/E3	0.877	0.810	0.842	10/D3	0.793	0.767	0.780	05/A1	0.716	0.696	0.706	06/D2	0.579	0.564	0.571
12/F1	0.724	1.000	0.840	06/A4	0.732	0.833	0.779	10/C1	0.740	0.675	0.706	13/A3	0.613	0.528	0.567
06/A3	0.783	0.903	0.839	12/A1	0.724	0.835	0.776	05/E2	0.667	0.747	0.705	10/A1	0.574	0.557	0.565
11/E1	0.870	0.811	0.839	06/G1	0.747	0.808	0.776	04/A1	0.717	0.691	0.704	13/B4	0.679	0.475	0.559
05/G1	0.807	0.871	0.838	04/A3	0.773	0.773	0.773	11/C1	0.676	0.735	0.704	06/A1	0.536	0.536	0.536
10/N1	0.761	0.931	0.837	12/C1	0.746	0.800	0.772	12/D2	0.765	0.650	0.703	12/B1	0.571	0.500	0.533
06/E3	0.903	0.778	0.836	10/F1	0.719	0.833	0.772	09/A1	0.692	0.692	0.692	08/B1	0.545	0.429	0.480
04/A4	0.756	0.930	0.834	08/C1	0.843	0.711	0.771	12/H3	0.786	0.611	0.688	13/B5	0.500	0.429	0.462
09/B2	0.833	0.833	0.833	04/A2	0.703	0.849	0.769	13/D2	0.706	0.667	0.686	07/H3	0.455	0.417	0.435
01/A6	0.769	0.909	0.833	07/H1	0.833	0.714	0.769	12/B2	0.765	0.619	0.684	02/A2	0.656	0.304	0.416
11/C4	0.792	0.875	0.832	12/G2	0.750	0.789	0.769	14/B2	0.700	0.667	0.683	02/B1	0.486	0.243	0.324
14/D1	0.848	0.813	0.830	13/B1	0.726	0.815	0.768	13/D4	0.625	0.726	0.672	03/B1	0.429	0.250	0.316
05/H2	0.759	0.917	0.830	11/A3	0.800	0.737	0.767	06/C1	0.624	0.724	0.670	07/F2	0.375	0.273	0.316
14/A2	0.786	0.880	0.830	08/E2	0.706	0.837	0.766	06/I1	0.703	0.634	0.667	10/I1	0.417	0.238	0.303
09/G2	0.824	0.824	0.824	12/G1	0.667	0.900	0.766	10/H1	0.875	0.538	0.667	07/D1	0.600	0.200	0.300
06/M2	0.778	0.875	0.824	10/F2	0.804	0.725	0.763	03/A1	0.692	0.643	0.667	02/A1	0.326	0.097	0.150
06/F4	0.790	0.856	0.822	09/G1	0.727	0.800	0.762	03/D2	0.636	0.700	0.667	05/F1	0.250	0.030	0.054
14/C2	0.780	0.868	0.821	09/C2	0.784	0.741	0.762	14/B1	0.667	0.667	0.667	06/F3	0.000	0.000	0.000

Table 5. Performance of SVM for professional *level II (Associate Professor)*. Only the top 15 features have been used for the classification. Each row corresponds to a RF. The results are ordered in descending order with respect to the F-measure values. Non-bibliometric RFs have a gray background.

SD	P	R	FM	SD	P	R	FM	SD	P	R	FM	S	P	R	FM
07/F1	0.928	0.951	0.939	06/F4	0.806	0.853	0.829	12/C2	0.826	0.731	0.776	07/B2	0.700	0.700	0.700
05/I1	0.851	1.000	0.919	10/G1	0.770	0.890	0.826	06/D3	0.757	0.795	0.776	10/I1	0.673	0.712	0.692
09/D1	0.878	0.959	0.917	06/B1	0.759	0.903	0.825	08/A1	0.756	0.797	0.776	11/B1	0.607	0.802	0.691
14/C1	0.850	0.994	0.916	08/B3	0.917	0.746	0.822	06/G1	0.794	0.759	0.776	13/D1	0.741	0.642	0.688
11/D2	0.959	0.863	0.909	14/B1	0.789	0.851	0.819	11/A1	0.730	0.821	0.773	10/M1	0.614	0.783	0.688
11/E4	0.833	0.992	0.906	05/B2	0.751	0.901	0.819	14/A1	0.673	0.907	0.773	12/G2	0.794	0.600	0.684
06/F2	0.844	0.970	0.903	11/A5	0.785	0.848	0.816	11/A2	0.739	0.806	0.771	13/A3	0.712	0.653	0.681
11/D1	0.813	1.000	0.897	09/E2	0.750	0.892	0.815	14/A2	0.752	0.784	0.768	10/E1	0.611	0.764	0.679
14/C2	0.814	0.996	0.895	07/G1	0.800	0.829	0.814	09/D3	0.767	0.767	0.767	01/A2	0.657	0.697	0.676
12/D2	0.810	1.000	0.895	04/A3	0.762	0.871	0.813	09/B1	0.684	0.867	0.765	13/B4	0.628	0.731	0.676
05/H2	0.807	1.000	0.893	11/C1	0.697	0.976	0.813	09/C2	0.765	0.765	0.765	06/F1	0.667	0.681	0.674
09/E4	0.891	0.891	0.891	05/A1	0.794	0.831	0.813	09/F2	0.868	0.680	0.763	06/E3	0.636	0.714	0.673
13/B3	0.862	0.920	0.890	13/A1	0.743	0.893	0.811	09/B2	0.727	0.800	0.762	04/A1	0.631	0.716	0.671
08/D1	0.804	0.989	0.887	07/B1	0.766	0.857	0.809	05/H1	0.674	0.875	0.762	06/D4	0.727	0.621	0.670
11/E2	0.888	0.882	0.885	12/G1	0.759	0.863	0.808	03/B1	0.756	0.765	0.761	01/A5	0.739	0.596	0.660
08/A2	0.838	0.925	0.879	06/D2	0.772	0.833	0.802	05/C1	0.725	0.798	0.760	11/E1	0.621	0.698	0.657
05/G1	0.868	0.889	0.878	09/B3	0.850	0.756	0.800	11/A3	0.716	0.810	0.760	01/A1	0.552	0.804	0.655
06/N1	0.781	1.000	0.877	12/E3	0.725	0.892	0.800	08/B2	0.878	0.667	0.758	01/A3	0.715	0.599	0.652
09/F1	0.877	0.864	0.870	08/E1	0.833	0.765	0.798	10/M2	0.706	0.818	0.758	03/D2	0.750	0.563	0.643
06/A3	0.771	0.993	0.868	13/A4	0.686	0.954	0.798	11/C4	0.688	0.841	0.757	09/A2	0.643	0.643	0.643
12/D1	0.876	0.856	0.866	10/F2	0.734	0.873	0.797	05/E2	0.676	0.861	0.757	10/H1	0.574	0.722	0.639
12/C1	0.899	0.833	0.865	08/A3	0.778	0.818	0.797	06/D5	0.672	0.865	0.756	13/C1	0.620	0.657	0.638
06/L1	0.776	0.976	0.865	11/C5	0.736	0.866	0.796	13/D2	0.722	0.792	0.755	12/H2	0.800	0.522	0.632
06/M2	0.784	0.956	0.862	09/H1	0.741	0.857	0.795	07/D1	0.718	0.792	0.753	09/A3	0.632	0.632	0.632
11/A4	0.797	0.939	0.862	03/C2	0.805	0.786	0.795	02/B2	0.730	0.773	0.751	09/A1	0.584	0.686	0.631
02/B3	0.789	0.950	0.862	13/B2	0.894	0.716	0.795	12/B2	0.712	0.792	0.750	07/F2	0.688	0.524	0.595
10/F1	0.759	0.994	0.861	08/A4	0.742	0.852	0.793	10/D4	0.662	0.847	0.743	10/N3	0.500	0.721	0.590
04/A4	0.759	0.989	0.859	03/D1	0.767	0.818	0.792	07/C1	0.724	0.764	0.743	07/H4	0.600	0.563	0.581
10/C1	0.814	0.907	0.858	06/C1	0.767	0.816	0.791	01/A6	0.657	0.852	0.742	07/H1	0.625	0.536	0.577
06/A2	0.767	0.973	0.857	05/A2	0.757	0.824	0.789	01/B1	0.748	0.733	0.740	07/H2	0.615	0.533	0.571
08/E2	0.746	1.000	0.855	05/E1	0.716	0.876	0.788	06/D6	0.733	0.747	0.740	07/A1	0.643	0.514	0.571
09/C1	0.819	0.894	0.855	10/D3	0.793	0.783	0.788	03/A2	0.663	0.832	0.738	13/A5	0.594	0.528	0.559
09/G2	0.823	0.886	0.853	12/B1	0.868	0.719	0.786	12/H3	0.764	0.714	0.738	02/B1	0.685	0.466	0.555
10/B1	0.742	1.000	0.852	05/D1	0.790	0.778	0.784	08/F1	0.672	0.806	0.733	13/A2	0.716	0.364	0.482
08/C1	0.887	0.812	0.848	01/A4	0.709	0.871	0.782	12/E2	0.717	0.750	0.733	03/B2	0.800	0.333	0.471
06/D1	0.807	0.888	0.846	11/E3	0.872	0.707	0.781	04/A2	0.701	0.761	0.730	12/H1	0.636	0.318	0.424
06/M1	0.822	0.861	0.841	11/C3	0.663	0.952	0.781	11/C2	0.626	0.870	0.728	14/B2	0.462	0.316	0.375
13/D3	0.817	0.866	0.841	10/L1	0.670	0.937	0.781	10/A1	0.673	0.785	0.725	10/D2	0.435	0.156	0.230
12/A1	0.729	0.991	0.840	13/D4	0.756	0.808	0.781	09/D2	0.646	0.824	0.724	08/B1	0.600	0.136	0.222
12/F1	0.723	1.000	0.839	06/H1	0.741	0.822	0.779	13/B5	0.739	0.708	0.723	10/F3	0.333	0.103	0.158
06/E1	0.788	0.893	0.837	02/C1	0.752	0.809	0.779	10/N1	0.648	0.814	0.722	07/H5	0.250	0.067	0.105
06/E2	0.763	0.926	0.837	09/E1	0.759	0.800	0.779	06/A1	0.697	0.742	0.719	05/F1	1.000	0.017	0.034
14/D1	0.887	0.787	0.834	06/A4	0.737	0.824	0.778	09/G1	0.793	0.657	0.719	07/H3	0.000	0.000	0.000
09/E3	0.796	0.872	0.832	03/C1	0.778	0.778	0.778	03/A1	0.639	0.802	0.711	02/A2	0.000	0.000	0.000
10/D1	0.835	0.828	0.831	06/I1	0.816	0.741	0.777	13/B1	0.788	0.641	0.707	02/A1	0.000	0.000	0.000
05/B1	0.761	0.914	0.830	12/E1	0.802	0.754	0.777	07/E1	0.615	0.812	0.700	06/F3	0.000	0.000	0.000

References