

# Diplomat Employment Problem for Multiperiod Assignments

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## **Abstract**

An employer or institution wants to hire a group of employees for a predetermined set of missions, each lasting for a certain duration. The employees will be reassigned to new missions periodically throughout their tenure. Missions may require different qualifications and vary in desirability among employees. The employer's objective is to assign an adequately qualified employee to each mission while maintaining balance in mission assignments in terms of their desirability. Thus, any disruption to the workplace harmony, potentially stemming from envy among employees, is prevented. Beyond the specific qualifications that employees may have, they are also vertically differentiated by their general ability, which we refer to as merit. In this context, an employer seeking to hire the most meritorious set of agents -who can be allocated to the missions requiring compatible qualifications (feasibility) while ensuring some sense of fairness in their careers (balancedness)-faces a multifaceted problem. Inspired by the employment of diplomats, this paper proposes a stylized model of this problem and outlines well defined employment procedures from the announcement of the job openings to the selection of employees, that achieves the employer's objectives.

## 1 Extended Abstract

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We model this problem as the challenge faced by a central authority seeking to hire a group of diplomats for a set of diplomatic missions designated for different periods of a diplomatic career, which we refer to as multiperiod assignments. Knowing the qualification requirements for each mission, the central authority makes a job announcement specifying the number of diplomats to be hired with particular qualifications. Individuals then apply to be hired as diplomats. Upon receiving applications, the central authority observes each applicant's qualifications and one dimensional merit score. Finally, the central authority chooses the set of diplomats from the pool of applicants.

When the selection of diplomats is constrained by a fairness policy based on merit scores and the initial job announcement, the diplomat employment problem reduces to determining the job announcement itself. It must be designed so that, regardless of the applicant pool, the distribution of qualifications among diplomats chosen by a well-defined choice rule permits a feasible multiperiod allocation. Furthermore, the feasibility (i.e. qualification compatibility) must align with the objective of maintaining balance in multiperiod assignments.

We characterize the set of job announcements satisfying all the objectives of the central authority as a solution to an integer programming problem. To formulate this integer programming problem, we propose a Hall-type theorem for a hypergraph constructed to represent the diplomat employment problem in multiperiod setting. Additionally, we demonstrate that this set of job announcements forms a lattice structure and the lattice relationship has implications for the chosen set of diplomats such as the comparison of chosen sets in terms of merit scores. Moreover, we show that the entire employment procedure is strategy-proof with respect to merit score and the disclosure of qualifications by the applicants.